THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D. } Editors.

NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

CONTENTS.

EDITORIALS :
American Institute of Mining Engineers 509
Augustus Steitz 509
Wurtz's Geometrical Chemistry 509
New Publications 510
International Exhibition of 1876, No. 2 510
Geometrical Chemistry 511
Colorado Mines 512
Historical Sketch of the International Exhibition of 1876 513
The Salineville, Ohio, Coal Region 514
Electricity vs. Gas 515
The Mines of Japan 515
The Silver Production of the Comstock Lode 516
Notes 516
Mining Notes from Colorado and Utah 517
STATISTICS OF COAL PRODUCTION 517
COAL TRADE REVIEW 517
IRON MARKET REVIEW 520
METALS 520
FINANCIAL :
New York Stocks 521
Philadelphia Stocks 521
Copper Stocks 522
Gold and Silver Stocks 522
Gas Stocks 522

AMERICAN INSTITUTE OF MINING ENGINEERS.

OFFICIAL BULLETIN.

THE adjourned annual meeting of the Institute will be held in Philadelphia at the hall of the Franklin Institute, Seventh Street, below Market, beginning Tuesday evening, June 20th, at 8 o'clock.

The joint discussion with the Society of Civil Engineers, on the subject of Technical Education, will be held on Monday evening, June 19th, at the same place. Members having papers to present at the meeting will please give timely notice to the Secretary. Those wishing to have illustrative drawings prepared for exhibition, by means of the lantern and lime-light, are requested to send the drawings promptly to the Secretary. Communications with reference to the Philadelphia Meeting may be addressed to Mr. J. B. PEARSE, Chairman of the Local Committee, 1601 Walnut Street, Philadelphia.

The Board of Directors of the Society of Civil Engineers has extended a cordial invitation to the members of the Institute to attend the Eighth Annual Convention of the Society in Philadelphia, June 13th to 15th, and to take active part in its deliberations. The sessions of the Society will be held daily from 9:30 o'clock, A. M., to 1:30 o'clock, P. M., in the Judges' Hall on the Centennial Grounds.

The Centennial Commission of the Society of Civil Engineers extend to the members of the Institute a cordial invitation to avail themselves of the facilities offered to engineers, at its rooms in the gallery of the west end of the Main Building. Mr. JOHN BOGART, resident Secretary of the Commission, will have his office at the rooms, to assist engineers with information concerning engineering exhibits.

THOMAS M. DROWN,
EASTON, PA. Secretary.

ANNUAL MEETING.

The annual meeting of the Institute, was held at the Secretary's Office, Easton, Pa., on Tuesday, the 23d inst., at one o'clock P. M. President HOLLEY appointed Messrs. J. C. KENT and FRANK FIRMSTONE Scrutineers to examine the ballots for officers.

The following were declared elected :

PRESIDENT—FOR ONE YEAR.
ABRAM S. HEWITT.
VICE-PRESIDENTS—FOR TWO YEARS.
W. P. BLAKE, E. B. COXE, R. W. RAYMOND.
MANAGERS—FOR THREE YEARS.
R. W. HUNT, J. S. NEWBERRY, T. F. WITHERBEE.
TREASURER—FOR ONE YEAR.
T. D. RAND.
SECRETARY—FOR ONE YEAR.
T. M. DROWN.

The meeting then adjourned to June 20th, the adjourned meeting to be held n Philadelph ia.

THOMAS M. DROWN, Secretary.

AUGUSTUS STEITZ.

THE news of the sudden death, at St. Louis, on the 17th instant, of Mr. AUGUSTUS STEITZ, will bring a pang of sorrow to many hearts, in which the loss of a dear and honored friend will overshadow, for a time at least, the regret that American metallurgy has been deprived, by his untimely death, of one of its most brilliant representatives. We cannot bring ourselves to consider this bereavement in its relations to the profession in which Mr. STEITZ was so eminent, until we have, at least, given faint expression to the memories of personal intimacy which crowd upon us. We recall with vivid distinctness the old student-life at Freiburg—the days of study and practice both above and underground—the jovial evenings of science and song and *Kartoffelsalat*—the strolls along the shady *Graben*—the longer walks to the *Hütten*—the foot journeys, with knapsack and staff, to Dresden or Chemnitz, and once far into Bohemia—fit scene of travel for our light Bohemian hearts. We remember our friend as he was in those happy days, perhaps the most steadily and eagerly industrious of all the American students then gathered at Freiberg, yet full of quick appreciation for both the ludicrous and the beautiful elements of that unforgotten and unforgettable *Burschenleben*, in which, if one-half was hard work, the other half was certainly (for the soul that could comprehend it) equally compounded of romance and laughter. To be, in the golden time of youth, merry and not frivolous ; to deeply cherish and steadily pursue an honorable ambition, and yet to take delight in the pleasures of nature and society ; to command respect, while sharing in the "furious fun" of gay companionship—this is an art not easily attained. But all the members of the pleasant circle to which we have alluded will bear us witness that this description justly applies to AUGUSTUS STEITZ.

After his return to this country, he devoted himself chiefly to metallurgical practice ; and at the time of his death was manager of the works of the St. Louis Smelting and Refining Co.—an establishment which owed both its existence and its success chiefly to his skill and perseverance. When the American Institute of Mining Engineers, at the time of its St. Louis meeting, visited these works, there was but one sentiment expressed or felt—that of admiration for the ingenuity and practical ability evinced in their management, and in the novel and effective devices which Mr. STEITZ, working quietly by himself, and blowing no trumpet to celebrate his achievements, had introduced into successful operation.

We need mention here only the use of the siphon for conveying melted lead from one part of the works to another ; the arrangement and management of the distillation of zinc-residues, the construction of the furnaces ; and at a somewhat later date, the remarkable invention of a water-cooled iron hearth for the principal part of the cupelling-process. Metallurgists in this country are already aware of the importance of many of the improvements which Mr. STEITZ was constantly contriving ; and they know also that his inventive genius did not waste itself in impractical fancies, nor fail to support its experiments with administrative skill. The works under Mr. STEITZ became perhaps the most profitable of the kind in the United States, for the amount of capital employed. He did not try to "revolutionize metallurgy" with new processes; but he did what is at once more difficult and more useful ; he perfected the old processes, and effected at various points great saving of labor and of cost.

Mr. STEITZ was always ready to welcome professional brethren, particularly his fellow-members of the Institute of Mining Engineers, and to give them the benefit of his wide experience. It was his desire also to contribute from the same rich storehouse something to the technical literature of his time. But with the exception of a single communication at the Institute meeting in St. Louis, he never furnished a paper on any of the subjects which he understood so well. Doubtless his intense occupation, and repeated periods of ill health, had much to do with this unfortunate omission ; but we know also that, more than once, he was prevented from making public descriptions and discussions of his works by the narrow and mistaken policy of the parties who controlled the St. Louis Smelting and Refining Company—a policy to which he submitted with great reluctance and under protest. Now he is gone ; and the gentlemen who happened to have the power, and were selfish and short-sighted enough to use the opportunity to limit his usefulness and fame while he lived, may profitably reflect that they have cheated the science metallurgy out of the wealth of knowledge he had accumulated, and that, in losing him, they have lost the repository in which they were so foolish as to keep it all shut up. We can imagine with what mingled humor and disgust the STEITZ of the old Freiberg days would have denounced such *Philisterei!*

For his own sake, as well as for the sake of his profession, Mr. STEITZ should have been permitted, and even urged, to diversify his labors. From the beginning of his active career, a too ardent devotion to the details of daily work at the furnace and in the laboratory seriously endangered his health. He was repeatedly prostrated by the effects of lead-poisoning; and we believe (though we have not yet received precise information) that this was the enemy which at last overcame his strength and took his life.

But it is useless now to wish that he had more thriftly preserved a life so honorable and useful. He squandered it royally on his work ; and the work itself bears testimony how dearly it has been purchased by the loss of such a man. Happy the country, the generation, the profession that owned him, if only they might find others like him—and keep them longer! *

WURTZ'S GEOMETRICAL CHEMISTRY.

THE Science of Chemistry, at least that of organic chemistry, has, of late years, become a perfect nightmare of formulæ and symbols to all who have had to wander in its labyrinthine paths. Our increase of knowledge seems but to make the confusion more and more complete, by adding new exceptions to what we had vainly hoped were "general laws," and making even a moderate degree of familiarity with the subject the work of a lifetime. We are now speaking from the stand-point of the "amateur in chemistry;" for it may be that there are "specialists" who find, in following out the infinite variety of chemical compounds, that kind of mental fascination which, in olden time, charmed away the life of the alchemist in his search after the philosopher's stone or the elixir of life—and which, in more recent days, cheats the simple mechanic out of his bread in his honest search after perpetual motion.

Few who have studied the laws of nature in those cases where they are best understood can accept our present complicated chemical hypotheses as the true enunciation of laws which are always exquisitely beautiful for their very simplicity. There has been among students of chemistry a general feeling of dissatisfaction with our present theories, and the discoverer of any simple general laws, which can be shown to govern chemical combinations, will well deserve, and will receive, the thanks of mankind, for he will vastly extend the benefits to be derived from a knowledge of the science. With these feelings we eagerly welcomed the promise held out to us many months ago, that the

laborious investigations then being made would demonstrate the existence of such simple laws, and simplify enormously this complicated study.

The fact that the discoveries now made public are the results of the indefatigable and laborious investigations of a thorough and painstaking student, a remarkably ingenious and clear-sighted generalizer, and one of the ablest chemists of our day, is sufficient to entitle the paper to the most careful consideration of scientists, and when so distinguished a chemist as Dr. T. STERRY HUNT, after investigation of the subject, expresses the opinion that "Prof. WURTZ has surprised Nature in one of her secrets," and has enunciated a law which is probably as important as that of the force of gravity—we need add but little to insure for the matter the most candid investigation.

The remarkable coincidences apparent in an enormous number of examples worked out by Professor WURTZ, and which our limited space obliges us to omit—are certainly strong confirmation, if not absolute proof, of the correctness of these generalizations.

To some of our readers this subject may appear as of interest to chemists only; such is, however, by no means the case. A correct knowledge of the chemico-physical properties of iron and steel, for example, lies at the very foundation of improvement in their manufacture. We may, therefore, look for the most important practical results in the manufacture and treatment of metals to follow from Prof. WURTZ's investigations, so that all who are interested in the manufacture or use of these, will find this communication full of interest and very suggestive.

THE REVIVAL OF BUSINESS.

Two auction sales, in this city, of some $3,500,000 worth of dry-goods, with a demand for more than was offered, and at prices "entirely satisfactory to manufacturers," were the most important features of the past week, or, indeed, of the year. Our mills are gradually resuming work, and our exports are rapidly increasing; it is said that one-fourth of the present product of the Fall River mills is sent to England, where it can be sold at figures leaving a profit to our manufacturers.

Having demonstrated this fact, we are looking to the markets to which England sends her surplus production, and there can be no question of our ultimate success in doing a large business with them. In a word, we have reached bottom in many classes of cotton goods, for we can export our surplus production, and have cleared off our old stocks. The future outlook of this industry is now encouraging—not that we anticipate high prices, or that there is much profit at present figures, but because we have demonstrated our abillty to export our surplus.

NEW PUBLICATIONS.

THE ECONOMY OF WORKSHOP MANIPULATION. By J. RICHARDS. E. & F. N. SPON, New York and London, 1876. Price $2.

THIS work was first published simultaneously in London *Engineering* and the *Journal of the Franklin Institute*, and we confess that we have been somewhat disappointed in a work brought out under such high auspices.

The object of the author is stated in the preface to have been to present workmen and apprentices a book which they would read, and which would set them thinking about the machines and processes daily in their sight. And, undoubtedly, he gives much that is suggestive, and of both value and interest, but as we have sifted the grains of useful information out of the great mass of words, we could not but feel that there is here a great "waste of the raw material." Either much more information should have been conveyed in these 171 octavo pages, or much fewer words should have sufficed to convey what is there.

It is true, the class of uneducated mechanics, for whose use the book is largely intended, may require the most self-evident mechanical principle to be repeated over and over again before it is fully comprehended, but this renders a book somewhat tiresome to other readers. Though we find much to commend and little to criticize, in this book, it is not one which inspires any great degree of enthusiasm. The following extracts give a fair idea of its style:

"There is no use in entering into a detailed explanation of what the reader has before him. Shafts are seen wherever there is machinery; it is easy to see the extent to which they are employed to transmit power, and the manner of arranging them. Various text books afford data for determining the amount of torsional strain that shafts of a given diameter will bear; explain that their capacity to resist torsional strain is as the cube of the diameter; that the deflection from transverse strain is so many degrees; with many other matters that are highly useful and proper to know. I will not devote any space to these things here, but notice some of the more obscure conditions which pertain to shafts, such as are demonstrated by practical experience, rather than deduced from mathematical data. What is said will apply especially to what is called line shafting for conveying and distributing power in machine shops and other manufacturing establishments. The following propositions, in regard to shafts, will assist in understanding what is to follow:

"1. The strength of shafts is governed by their size and the arrangement of their supports.

"2. The capacity of shafts is governed by their strength and the speed at which they run together.

"3. The strain to which shafts are subjected are the torsional strain of transmission, transverse strain from belts and wheels and strains from accidents, such as winding of belts.

"4. The speed at which shafts should run is governed by their size, the nature of the machinery to be driven, and the kind of bearings in which they are supported.

"5. As the strength of shafts is determined by their size, and their size fixed by the strains to which they are subjected, strains are first to be considered." * * *

"Experience has demonstrated that for ordinary cases where power is transmitted with tolerable regularity, a shaft three inches in diameter, making one hundred and fifty revolutions a minute, its bearings three to four diameters in length and placed ten feet apart, will safely transmit fifty horses power."

This extract may be taken as a fair specimen of the book. The whole substance is summed up in the last paragraph, which is clear, exact, and correct-while that which precedes could not be understood by one not familiar with, the subject, and is neither exact nor strictly correct.

INTERNATIONAL EXHIBITION OF 1876.

Special Report of the Engineering and Mining Journal, No. 3.

A CONSIDERABLE increase in the number of visitors to the Exhibition for the past week, as shown below, over that of the first week, is quite gratifying.

ATTENDANCE AT THE EXHIBITION.

Date.	Paying Visitors.	Complimentary.	Press, Exhibitors, etc	Total Visitors.
Previously reported.....	130,802	33,242	29,714	193,758
May 17.....	12,117	387	6,208	18,712
" 18.....	11,054	440	6,325	17,819
" 19.....	16,100	480	7,047	23,627
" 20.....	18,191	546	7,379	26,116
" 22.....	12,402	540	7,928	20,870
" 23.....	17,542	577	7,548	25,667
Totals...	218,208	36,212	72,149	326'569

There will have to be, however, many more per day to satisfy the desiresf the great army who have expected to make large or small fortunes out of the visitors to Philadelphia this Summer. To those who saw the situation of the present buildings two years ago, the change seems simply wonderful. Then there was hardly a building of any kind in the neighborhood, while to-day the number inside the Centennial Grounds is excelled many times by those oute side. Within a year a young city has sprung up on the ground lying to the south and east of the Main Building and Machinery Hall, the denizens of which are all highly interested in the question as to whether the Exhibition is to be a success. With many, their whole fortune is at stake, and unless the country cousins come in thick and fast during the next six months, more losses than gains will be reckoned up at the end of the Exhibition. In character this town is even more temporary than some of the mushroom cities that spring up in our new mining districts; every one has something to sell, and the buyers are here for a week or a day only.

Although there are immense hotels, gorgeous theaters and the permanencies of gas-lighted and paved streets, yet when the Exhibition is over all this must quickly disappear. But few live in this neighborhood, and its considerable distance from the city will prevent it from soon becoming a favorite quarter for residents. Some undaunted Americans have, in the face of the overwhelming display mad in the Exhibition, put up shows of their own, hoping to attract enough of those who, bewildered, have seen too much, or, unsatiated, have not seen enough at the grand show. This outside town is well guarded, and those who feared that the approach to the grounds might be as unsafe at times as were the battle fields when Philadelphia firemen, in the good old days of the volunteer system, disputed for supremacy, will, apparently, not have their forebodings realized. Inside the grounds the prospect each day is becoming more cheerful. The trees are now in full leaf, much of what was yellow soil is green with grass, the paths, such as they are, are nearly all finished, and the Horticultural Department has made the grounds around the Hall most attractive by dotting them with beds filled with flowering plants.

The Commission of Judges of the Exhibition held their first session on Wednesday, the 24th. The list has been considerably changed and added to in some departments since it was first published, as will be seen in the revised list to be published in our next issue. It is thought that there will be many practical difficulties in carrying out some of the features of the plan proposed for making examinations and awards. A foreign and American judge are to be joined together for the examination of certain exhibits, and, when speaking different languages, or when different opinions exist, it may be difficult to render unanimous opinion on the merits of particular displays.

In the Main Building some quite interesting changes have been made within the last week. Mexico, which at the opening of the Exhibition made no display whatever, is now nearly ready. The mineral resources of the country are very well illustrated by suits of specimens of silver, lead, copper, and iron ores from various mines. Among the metallic displays there is a silver button, resulting from the cupellation of argentiferous lead, which weighs a little over two tons. Until the Big Bonanza proprietors send on that ten million dollar pile this button will represent the greatest value of any one exhibit of the precious metals. Mexico has, at last, got to making iron, and the Encarnacion and Guadalupe Works, of the State of Hidalgo, send on samples of their ores and finished iron. The latter has the appearance of having been made by some direct process and, when worked, shows signs of red shortness. A large mass of volcanic sulphur and a variety of very handsome marbles are also in the Mexican collection. Spain has now nearly ready a very good exhibit of minerals, including coal specimens, which she has honored by giving the front of her space on the main passage way. The hematite ores of the North Coast, near Bilboa and Irun, are shown in great variety. The Bilboa Iron Company and YBARRA & Co., of the same place, have a considerable number of iron specimens which show, by the tests to which they have been subjected, such qualities as the pure ores from which they are made would lead one to expect. From the Almaden district there are a number of suits of specimens of the quicksilver ores, principally cinnabar. There are also a number of lead and copper ores with ingots of the latter metal. Spain, like a good many other countries, has lately found some coal deposits, of which she has sent some very good specimens. A number of them have the appearance of true bituminous coal while others are, evidently, lignites. Austria has had unpacked for several weeks, but not arranged, a series of ingots of ferro-manganese, which contain as much as sixty per cent. of metallic manganese. It is probable that these are made by reduction in blast-furnaces, although no labels as yet indicate this. Russia now shows some specimens of copper ore which, probably, are not intended for smelting purposes, as from the prices affixed, they are sold at the rate of about fifty thousand dollars a ton. There are specimens of the famous Russian malachites, which have been finished up into tables, vases, mantels, etc., of the most marvelous beauty. We note, particularly, a mantel of malachite, with bunches of grapes carved out of fluor spar, giving the most exquisite effects.

GEOMETRICAL CHEMISTRY.*

By Henry Wurtz.

I PROPOSE in this memoir to demonstrate, chemically and arithmetically, the *Relative Diameters of the Chemical Molecules in Solids and Liquids;* and to lay, for the first time, the foundation of *a real Geometrical and Dynamical Science of Chemistry* † * * *

The extreme prevalence, among chemists of the present day, of the system of Graphic Formulation, founded primarily upon the laws of equivalency of the elements with *replaceable* hydrogen—which has led to results so fortunate in some cases, that many have come to look upon it as a sort of Chemical *Cabbala*, by which all Nature's mysteries are to be tested and interpreted, with unquestioning faith—even this beautifully ingenious, but artificial invention, with its physically and mathematically monstrous arrangements of atoms in symmetrical plane figures, should, I believe, be looked upon as the index of a wide expectation of the possibility of a real Geometrical Chemistry.

It will here be in point to quote a brief passage from Dr. CRUM BROWN, who is reputed to be the first inventor of a "Graphic Notation" according to "atomicity," in an address as Presiding Officer of the Chemical Section of the British Association in 1874—a passage in which this chemist proves himself an advanced and courageous thinker:—"One thing we can distinctly see—we are struggling towards a theory of chemistry. Such a theory we do not possess. What we are sometimes pleased to dignify with that name is a collection of generalizations of various degrees of imperfection. We cannot attain to a real theory of chemistry until we are able to connect the science by some hypothesis with the general theory of dynamics. No attempt of this kind has hitherto been made, and it is difficult to see how any such attempt can be made until we know something in reference to the absolute size, mass, and shape of molecules and of atoms, the position of the atoms in the molecules, and the nature of the forces acting upon them. Whence can we look for such knowledge?"

The *attempt* here referred to I have made, and some of its results I shall now have the honor to submit to the judgment of the chemical world. It is no mere string of speculations that I have to offer, but a succession of faithful and laborious *generalizations* direct from facts and figures. * * *

My studies of the subject of Molecular Chemistry of solids and liquids, began many years since, with that of Thermo-Chemistry. I quickly saw that not only are changes of temperature and of volume correlative, but that changes of thermic conditions and relations, in a medium of fixed temperature, are invariably concomitant with changes both of chemical (or molecular) nature, and of *Volume*. I turned at once to the investigation of the changes of volume; that is, of molecular condensation; as furnishing an indubitable index to the changes of internal molecular structure and nature. This rendered necessary the generalization of great ranges of facts—and reliable *Methods of Investigation* were needed from the start. *Working Hypothesis* were essential, to begin with. I soon found that those in general use were inconsistent, and but distant approximations at the best. HERMANN KOPP'S figures for the relative volumes of oxygen and hydrogen in water, arrived at by most ingenious processes, required but little examination to develop inconsistent deductions. * * *

I held, speculatively, in common with the general chemical sentiment of this day, that the *perfect* state of matter, in which the simplest laws prevail, and out of which all the laws that govern matter, even in its liquid and solid states, ought to be evolved, is the *gaseous* state. I *now* hold, as the result of actual generalization, a view precisely opposite, namely, that the gaseous state is one in which expansive or repulsive energy is predominant, to the point of antagonizing and nullifying most of the other laws and forces of matter, and even—in the case of compound gaseous molecules—to the extreme point of incipient decomposition, or *dissociation;* and that therefore, as an exceptional state of matter, the gaseous state is one which is not qualified to yield us any reliable knowledge of many essential laws that govern chemical combination and condensation, and the modes of operation of chemical energy. * * *

To obtain the law for gases, it is essential to compare them *at one and the same temperature*. I concluded, therefore, that in solids and liquids also, whatever the relation of volumes, or volumic law, might be, it would almost certainly be found to prevail at some *one* (or more) *uniform* degree (or degrees) of temperature. It was natural for me to resort, hypothetically, to two points, that of *melting ice*, and that of the *maximum density* of water, 4° C. As they advanced, my computations constantly indicated, and cumulatively compelled the ultimate conviction, that at least *one* Standard Temperature of Nature, at which simple relations between certain molecular dimensions of both solids and liquids are sharply fulfilled, is that at which all motion and life begin on the solid surface of the earth—that at which *Ice* passes from the solid to the liquid state—the *Molecular* or *Equivalent Volume of Ice, at its point of incipient fusion*, being a *Standard Volume in Nature*, to which the volumes of all solid and liquid bodies may be referred, when at that same temperature.

This point of incipient fusion of ice is probably slightly *below* the centigrade zero, as will be explained further on.

I find ice to constitute one of the simplest of molecules, while liquid water is one of considerable complexity of constitution. A notion will thus be conveyed of the *raison d'être* of the Ice-Standard, which will become clearer as we proceed. * * *

I made extensive experiments with the volumes of oxygen and hydrogen given by KOPP, * * * and always obtained results almost uniformly unsatisfactory. I sought, therefore, whether, throughout the vast resources of chemistry, we might not be permitted to discover a true starting-point, in the *real* relative volume of oxygen in water. It was not long before I found, to my astonishment, that a figure which leads us directly—and, as it turned out, truly and narrowly—to the correct volume of the oxygen in water, has been for nearly sixty years in the possession of the chemical world. It is the density of *peroxide of hydrogen*, as determined by Baron THÉNARD, in 1818=1·452. Applying certain corrections, due to the presence of about 2·63 per cent. of water as an impurity, this gave for oxygen at zero almost exactly (as corrected slightly from other data afterwards obtained from other sources) the volume 5·184, and therefore for that of hydrogen 6·408. These figures, with the assumption that *the two volumes of oxygen in peroxide of hydrogen are identically large*, marked my initial point of successful advancement. This was my *Working Hypothesis*—the gate that admitted me into the unknown land.

On first applying my new *hydrogen-volume* to hydrocarbons, with a view to obtain the *carbon-volume*, which was the next step, I arrived at inconsistent and a number of the *carbonates*, I rapidly obtained the most conclusive evidence that I must *here*, at least, be upon the right track, the C-volume coming out in most cases almost exactly 8. * * Turning again to the hydrocarbons, with the new carbon-volume, the startling fact at once came out that hydrogen is a *Protean* element. In organic compounds it scarcely ever passes from one form of combi- discouraging results; but, on experimenting with the new *oxygen-volume* upon nation to another without change of volume, and its special volume in *liquid water* belongs to the peculiar molecule of that body. The whole vast fabric of Organic Chemistry, or the Chemistry of Life, and the endless variety of the compounds of the organic kind, are mainly due to this Protean attribute of hydrogen; to its continual condensations and expansions in passing from one form of condensation to another. * * *

It was now with me but a matter of time—involving, nevertheless, long, patient, and laborious experiment—to arrive at the beautiful laws which govern these hydrogen condensations; and gradually then, step by step, the whole magnificent system unrolled itself before my mind. I do not believe it presumption on my part to think that at this time my feelings may have been similar to those of KEPLER, when his grand planetary laws were slowly unfolding themselves to his intellect. Scarce a day passed without some new discovery, or the gaining of some new and wonderful idea. Some of the chief of these I shall now endeavor to set forth.

My fundamental hypothesis regarding the equality of the oxygen-volumes in peroxide of hydrogen, has extended itself so far as to indicate the broad generalization that oxygen, *in compounds*, is a changeless element, probably the only element which passes through all classes of compounds without condensation or expansion. Real *reasons* why this immutability of volume should inhere in *oxygen*, and in that element alone, will appear further on.

Carbon, also, appears to be changeless in all hydrocarbon compounds (being always=8) though in *diamond, graphite*, liquid CO^2, CS^2, and some other compounds, it is variable, within limits which are at least as 10 to 1 (the range of H being probably as 20 or more, to 1).

I shall next explain, in part, the law of hydrogen condensation, in one of its commonest phases, that in hydrocarbons. Carbon and hydrogen form an *elementoid* group of atoms, a *compound radical*, of the composition H^2C, whose molecule undergoes condensations and expansions *as a whole*, or *as an element*, according to the geometrical law which governs the elements, to be stated below. [In this molecule it is only the hydrogen upon which the condensation falls, the carbon remaining unchanged with its volume of 8.]

This new (or at least newly determined and demonstrated) compound radical H^2C, I propose to call *Homologen*, with symbol Hm, from its being the agent in the formation of homologous series, or homologues. Homologen is to be placed alongside of *Ammonium*, as a basylic or electro-positive radical or elementoid. This is *the only hydrocarbon radical that exists*, so far as I can discover. The "alcohol radicals" *Ethyle, Methyle, Propyle, Butyle*, and all that army of myths, which have so trammeled the science, must now at last pass off the scene forever. It is easy, by the methods which I develop, to demonstrate the impossibility of their existence. Indeed, it will be seen, on a moment's consideration, that the so-called alcohol-radicals are themselves merely a homologous series, built up by successive additions, *to one hydrogen atom*, of successive molecules of H^2C, or homologen. Homologen having itself a demonstrated existence, the imaginary alcohol-radicals, if extant, are therefore necessarily only a series of compounds of homologen. The new radical occupies the whole field of carbo-hydrogen chemistry, with certain exceptions, to be explained hereafter.

In proceeding to my next point, I may premise that few new developments in any science, could ever have excited more surprise—probably incredulity at first glance, than the discovery I have next to announce. Water itself, or, at least the compound H^2O, like H^2C, turns out to be also, in combination, a *real* elementoid, or *compound radical*. Instead of being an oxide of a metal "hydrogenium," in the sense in which K^2O, for example, is an oxide of potassium—that is, instead of performing the function of an oxidized radical—it really enters into combination in a way much more closely comparable to that of *cyanogen*, which, so far as I yet know, is its nearest analogue. Its molecules in combination, and in one case that of *ice*, when free, fall under, and suffer expansions and contractions under the geometric law, stated below, like one of the elements. * * *

Water, as a radical, must have, like its associate radical, homologen, a distinctive name. I can devise no better plan than to resort to the Greek word *Hydor*, which I therefore submit, as the generic name for the numerous condensations of H^2O in its elementoid or radical capacity; its abbreviated symbol being Hδ, and its compounds hydorides. Hydor is acidic or electro-negative, like cyanogen; being unlike homologen, which tends towards the opposite range of the electro-chemical scale. * * *

I believe I have gone far enough—in the way of introductory explanation—to justify me in proceeding at once to the enunciation of the great new *Law of Molecular Volumes*, whose discovery has rewarded my labors.

FIRST LAW.

THE GEOMETRIC LAW OF MOLECULAR CONDENSATION.

The volumes of all single Chemical Molecules, whether of Elements or of Radicals—with the one sole exception of Oxygen—are expressible by quantities having, at the Temperature of incipient Ice-Fusion, the relation of Even Cubes of a Series of Whole Numbers, of which Series the number pertaining to the Molecule of Ice at this temperature is 27.

To this, which is the expression of an all-comprehensive generalization, I shall at present add only that I look upon this series of whole numbers—these cube-roots of the molecular volumes—in the light of the *Diameters of the Molecules*, regarded as Geometric Solids, and speak of them as "molecular diameters." In order to avoid decimal fractions, both in the volumes and in their cube-roots, the diameters, and to make the latter all integers, I substitute for the usual unitary equivalent of hydrogen (whose assumption gives us the starting-point of all computation in chemistry) the number 1,000. That is, I simply, for convenience, state both equivalent weights and volumes 1,000 times larger, and their cube-roots *ten times* larger, than they would be on the usual basis. The volumes before stated for O, H in common water, and organic C, become, by this simple device, 5,184., 6,408., and 8,000. The last figure, it will be observed, is the even cube of 20, this being the diameter of the carbon-molecule in all organic compounds and in carbonates, though certainly not in many other forms. Thus, in the diamond, for example, carbon has the volume $3{,}375=(15)^3$, its true density *at zero* being obtainable as the dividend of the volume into the equivalent. Thus $\frac{12000}{3375}=3.555+$. The two highest densities on record—taken from crystals having possibly some slight cavities, and *at*

*Abstract of a paper read before the American Institute of Mining Engineers, at the Washington Meeting, February, 1876. The full text of the paper will found in the March number (just issued) of the *American Chemist*.

† It may assist some readers to follow me, if I say here that by "molecules" I mean merely *the things*, or entities, *that combine to form chemical compounds*.

normal temperature—by BRISSON and PELOUZE, are both 3.55. The diamond-molecule *diameter*, is therefore 15.

It is plain that even if the molecules are really all *spheres*, the molecular volumes necessarily include the *intermolecular spaces;* and in a homogeneous collocation of equal molecules, whatever form the latter may have, each one—with the surrounding intermolecular space throughout which its energy acts, and which this energy maintains around it—must be admitted to have, *in effect*, a cubical form. This is made clearer in a paragraph further on.

[Professor WURTZ here introduces what he calls a *Geometric Volumic Multiplication Table* (a table of cubes and cube-roots) to assist in this kind of computations. He then gives, as introductory to his special detailed examples of geometrically formulated chemical compounds, a few *General Diametric Relations.*]

Among Acidic Elements, both *Halogens* and *Amphigens* (including the halogen elementoid *Cyanogen*, and excluding *Oxygen*), the only diameters so far recognized, in compounds, are 24 and 28—except in the case of the highly electric negative *Fluorine*, which has 18, near Oxygen.

CHLORINE, in haloids, or monadic and dyadic chlorides generally, and in chlorates, has 24.

SULPHUR, in most metallic sulphides, and all sulphates, has 24.

SELENIUM generally has 28 in *selenates* and 24 in *selenides*.

CHLORINE, in triadic and tetradic chlorides, and in liquid polychlorides generally, has 28.

BROMINE and IODINE, in all compounds, so far as yet known, have 28, except in bromates and iodates, where they have 24.

CARBON (as stated before), in all organic or hydrogen compounds, and in carbonates, has 20.

NITROGEN, except in Cy and in its simple oxides, has, so far as known, 20.

CYANOGEN has 24, in all cyanides, simple and complex.

SILICON, in quartz, and probably all crystalline silicates, has 23.

HYDROGEN (elemental) varies greatly, being generally found, however, between 16 and 28. Several highly basic metals (*Aluminum*, for example) vie with it in mutability.

A GENERAL LAW.—It will conduce to a more speedy comprehension of the new system, if I anticipate also by stating one universal principle, namely: that *the tendency to variability of diameter and the approach to the positive extremity of the Electro-Chemical Scale, are parallel*—that is, the more *basylic* the element or elementoid, the more variable in volume, and the more *acidic* the more invariable. Oxygen, *the most electro-negative element*, never varies at all.

[He then proceeds to the long list of compounds, which he gives as examples of the great work he has already done, though only on the threshold as yet. We can only select a case here and there as an illustration. It may be sufficient for explanation of the formulæ, to say merely that the number indicating what is designated as the "diameter" of the elementary molecule, that is the cube-root of the space occupied by it, is placed *under the symbol* which denotes, as in all chemical notation, the equivalent weight of the element or radical.]* * *

PCl^3—BUFF gives at 0° 1.6119

$$2\,{}^{P}_{27}\,6\,{}^{Cl}_{28}=1.608$$

$POCl^3$—T. E. THORPE, at 0°..... 1.71185

$$O^2\quad 6\,{}^{Cl}_{28}\qquad {}^{P}_{27}\ {}^{P}_{26}=1.711842$$

[The existence of the radical PO, "*phosphoryle*"—whereon the hydroxyle school build their view of the constitution of phosphorus-acids—may here be finely tested. The nearest approach to THORPE'S figure that phosphoryle allows is—$\,{}^{PO}_{29}\ {}^{PO}_{28}\ 6\,{}^{Cl}_{28}=1.7242$. The result is therefore discordant.]

VCl^4—ROSCOE, at 0°..... 1.8584

$$\left({}^{V}_{25}\ {}^{V}_{26}\right)\quad 8\,{}^{Cl}_{28}=1.8514$$

$AsCl^3$—PIERRE, at 0°..... 2.20495

$$\left({}^{As}_{25}\ {}^{As}_{26}\right)\quad 6\,{}^{Cl}_{28}=2.20495$$

$SOCl^2$ AD. WURTZ at 0°..... 1.675

$$O\quad {}^{S}_{28}\qquad 2\,{}^{Cl}_{28}=1.675$$

$PSCl^3$—T. E. THORPE, at 0°..... 1.66816

$$\ {}^{P}_{24}\ {}^{S}_{28}\qquad 3\,{}^{Cl}_{28}=1.667$$

Quartz.—Of 11 determinations of quartz by different chemists, the range is very narrow, from 2·64 to 2·66. The last figure is given by BREITHAUPT and DEVILLE.

$$O^2\ {}^{Si}_{23}=2.662$$

This silicon-molecule $\,{}^{Si}_{23}$ runs through all crystallized silicates, so far as I have examined; and its discovery will be of vital service to the science of Mineralogy, to the extent of reconstruction in some of its views. * * *

$Na^2O\ CO^2$. Two allotropes—

PLAYFAIR and JOULE..... 2·43

$$O^3\ {}^{C}_{20}\left({}^{Na}_{21}\ {}^{Na}_{22}\right)=2.439$$

FILHOL..... 2·509

$$O^3\ {}^{C}_{20}\ 2\,{}^{N}_{21}=2.519$$

$FeO.CO^2$. *Siderite.*—This compound being specially instructive I shall cite the whole list of density figures—

BREITHAUPT	3·698
KOPP, at 0°	3·796
DUFRENOY	3·815
MOHS	3·829
NAUMANN	3·872

These figures correspond to the following structures:

BREITHAUPT'S.....$O^{12}\ 4\,{}^{C}_{20}\left(3\,{}^{Fe}_{20}\ {}^{Fe}_{19}\right)=3.709$

KOPP'S zero figure.....$O^{18}\ 6\,{}^{C}_{20}\left({}^{Fe}_{20}\ 5\,{}^{Fe}_{19}\right)=3.791$

DUFRENOY'S (normal siderite?).....$O^3\,{}^{C}_{20}\ {}^{Fe}_{19}=3.815$

MOHS'S.....$O^{21}\ 7\,{}^{C}_{20}\left({}^{Fe}_{18}\ 6\,{}^{Fe}_{19}\right)=3.833$

NAUMANN'S.....$O^6\ 2\,{}^{C}_{20}\left({}^{Fe}_{18}\ {}^{Fe}_{19}\right)=3.88$

The instructive and suggestive circumstance is this, that each one of these molecules (except the last one), is found repeated in a definite variety of *commercial metallic iron*. Thus, the molecule of iron in BREITHAUPT'S siderite represents the average of the best American cast gun-metals, according to WADE, and the densest British pig iron, according to ABEL. The molecule in KOPP'S siderite is the heaviest (according to KOPPMAYER) of Bessemer metal, containing the *minimum*, 0·14 of carbon. That in DUFRENOY'S (normal?) siderite is the molecule of *electrolytic* iron; and that in MOHS'S is almost identical with the densest rolled iron on record so far, found by BELANI in Bessemer rails (D.=8·408.) [This interesting subject, with many similar facts, will be returned to in a special Memoir on the *Molecular Nature of Iron.*]

TO BE CONTINUED.

COLORADO MINES.

Special Correspondence of the Engineering and Mining Journal.

Among the Georgetown Silver Mines—Bullion and Ore Product—A New Mill—What the Mines are Doing—Some Big Law Suits—Mining Sales—Consolidation.

MINING affairs at Georgetown are in much the same condition as during the past year. Several of the most important mines are improving greatly, exceedingly rich veins and pockets of ore are reported in many localities, and the ore and bullion export, as usual, comes mainly from a very large number of lodes. The decline and fluctuations in silver bullion have affected the ore market badly, but the production is again on the increase. For the four months ending May 1, the bullion yield of Clear Creek County is estimated at $190,000, and the value of ore shipments at $400,000.

Great benefits are resulting from the operations of the concentration works (wet and dry), although these are not yet working up to more than two-thirds of their capacity. Of these, TAYLOR'S (Krom Separator), in Georgetown, has been dressing some 30 tons of ore daily for the past three months, mainly from the Pelican lode. EDDY'S establishment, at Silver Plume, handles an equal quantity by the wet process, chiefly from the Dives. Other lodes will soon contribute largely to both places, and the quantity of hitherto worthless ore that will be made available will exceed the entire quantity of ore formerly treated or shipped from the district.

The mines will be very creditably represented at the Centennial. The Pelican sends a 4,000-pound specimen, the Dives one weighing over a ton, the Roe and Hercules, among others, show a 500-pound lump, and the Baxter, Colorado Central, and Marshall Tunnel are among those making a good show.

ROBERT CASH has secured a mill site in Georgetown, and has begun the work of erecting chlorination and lixiviation works of about 15 tons daily capacity. It is thought these will prove of substantial benefit to the miners, by reason of the cheapness of the process and the high percentage of silver saved. STEWART is moving slowly in the work of rebuilding the roasting and amalgamating mill burned last December, but is operating the HUNT & DOUGLASS leeching process, that department having escaped the flames. The Pelican and the Judd & Crosby mills make regularly weekly shipments of silver bars.

The famous Pelican and Dives Mines have each increased their force of miners. The former employs about 100 and the Dives nearly 200 men. Litigation still continues, but not so as to seriously retard work. The Dives is now richest in the McMurdy or eastern 1,000-feet. The Perdue company's 500 feet on the west, that yielded so enormously in 1874, still shows plenty of ore, but of low grade. Both properties are under one management. The Pelican vein is now 12 feet wide, and will soon be furnishing more than the mill's capacity, which is about 10 tons, or over, daily.

On the north side of Leavenworth Mountain, in the midst of this great silver belt, is the Pulaski lode, which is mined chiefly for its gold product. It carries from one to four ounces per ton of gold, and a smaller value in silver. Its great size renders it profitable. East of the Dives, the Baxter is paying largely, and so is the immense Pay Rock lode, while further up the slope of Sherman Mountain the Silver Plume and Snowdrift are yielding handsomely. The almost inaccessible Stevens Mine, on McLelland Mountain, shows by far the best body of ore ever found in it. On the opposite mountain, near Gray's Peak, is the Baker, soon to be worked very extensively. These are but a few of the mines now making a good record.

The Terrible Mining Company has been doing nothing for over a year, and is restrained by injunction from operating on the ore body that paid them so well. Ever since 1869 WILLIAM A. HAMILL, the owner of the Silver Ore and Gun Boat lodes, has had a contest here—first with CLARK & CROW and then with the English company who bought 700 feet of the Terrible for £100,000 in 1870. HAMILL had no money to develop and prove up his property—and as it now appears the company run a cross cut from the Terrible into what proves to be the Silver Ore. They continued operations until 1874, when a profit of over $88,000 was realized. HAMILL then offered to sell his claims and property for £25,000, which proposition was declined. He had now become manager of the great Dives Mine, and, having money at his command, proceeded with the work of opening and proving up his lodes, until the Gun Boat was found to be the same vein as the Terrible, and the Silver Ore was shown to contain the rich ore deposits that the Terrible company had been mining. Mr. TEAL, the agent for the company, as well as his successor in office then and afterwards, recommended the purchase of HAMILL'S properties at the price then asked by him, viz., £40,000, or $200,000, but on the arrival of the agent from England in New York, some Colorado lawyers succeeded in stopping negotiations. Very recently the company offered to take the property on those terms, but so rich and extensive has the ore vein proved of late that HAMILL now refuses to sell at that figure, and continues to work his lodes, on which he has obtained Government patents.

The Coldstream and Phœnix suits, and those of the Equator and Colorado Central, still drag their slow lengths along. Nevertheless, these mines are paying largely. Litigation is the curse of this district. It retards development, causes valuable property to remain idle, and prevents an increase in the bullion product of a million per annum. There are, however, signs of improvement in this direction that indicate better things in the future.

An instance where a wiser course has been pursued is furnished in the history of the Roe and Hercules lodes. Here litigation and the lawyers were at last dispensed with for purchase and compromise, until all conflicting claims and grounds have been secured by, and covered with U. S. patents for one combination. As this is one of the most important and profitable properties in this section, and as its past record represents, to a certain degree, that of many other valuable mines, some details in regard to it and its management and condition may not be out of place here.

As is so often the case, several locations were made and shafts sunk, each claimed to be on a different lode, where subsequent developments prove but one vein to exist. Five different parties obtained a foothold on the 5,000 feet of what is now known as the Hercules vein. At different points the names Hercules, West-Hercules, Seven-Thirty, John M. Wilson, and John E. McClung

were recorded. A larger, stronger, and nearly parallel vein, then known as the East Roe, crosses this lode where both veins cross Brown Gulch. The location is at the union of Brown and Sherman Mountains, known further east as Republican Mountain, and about a quarter of a mile above the Terrible and Brown Mines. What is evidently the same great ore channel bears the name of Atlantic and Shively on the west, and Phœnix, Coldstream, Pelican, Dives, and Pay Rock on the east. From one property on the Hercules the International company obtained, in a short period of time, $150,000. The contests between the operators of the Roe, Hercules, Seven-Thirty, and others, were fierce and bitter, and production and development were greatly restricted thereby.

Late in the summer of 1875 a union of interests was so far effected that the various claims were combined in two companies—East Roe and the Hercules, and Seven-Thirty. The results were larger yields and profits than ever before—although the work was mainly that of development—and the following monthly dividends were paid on a capital stock of $150,000 for each company: East Roe, one of 1¼ per cent., four of 2, and one of 1½ per cent.; Hercules and Seven-Thirty, three of 1½ per cent.

Early in 1876 these organizations were merged into the Consolidated Roe and Hercules Mining Company, owning 6,500 feet of veins, and having a capital stock of $1,500,000, with $200,000 paid in working capital. At and near the junction under Brown Gulch, 1,200 feet of this property has been opened by 6 shafts and 2,500 feet of levels, at an outlay of about $80,000, while the receipts have exceeded a quarter of a million. At this point the tunnel, 150 feet long, intersects the two veins at the point of their union, at a depth of 120 feet, from which a level extends 700 feet west and 300 feet east on the Hercules, and shorter distances on the Roe. Here is the main shaft, now 80 feet below the tunnel level, from which levels are being run. Owing to the heavy incline of the mountain on either side of the ravine, the long level gains from 300 to 400 feet in depth on the vein as it goes east and west, or from 50 to 70 per cent. of the length driven. Careful estimates, based on surveys and past yields, make a total of 1,500 fathoms of unworked ground above the lowest workings, whose contents are estimated to have a value of nearly $1,500,000. At the mouth of he tunnel are some 300 tons of ore, one half of which runs in the mill at the rate of $100 per ton, and the remainder at $40, which dressing will make available. The large force of men employed in the mines will soon be increased.

The Burleigh tunnel, 1,820 feet long, will intersect these veins when driven 700 feet further, 1,400 feet below the present workings, and 2,000 feet below their outcroppings further east.

The distance between walls in the Roe is 6 and 7 feet, with a vein of mineral from 6 to 12 inches wide, that sometimes increases to 3 feet. The Hercules is nearly as large. Narrow seams of ore extend through the crevices that sometimes carry at the rate of $1,000 and over per ton. At one point in the Hercules is a rare kind of silver ore, said to be found nowhere, except in one locality in the Sutro tunnel, and assays give a return of $3,000. The first-class ore from these mines runs from $300 to $500 per ton, and the average receipts from all ore sold have been $241 per ton. The mountain sides are covered with a heavy growth of pine, so that the cost of timbering the mines is but a mere trifle. Ample water power is furnished by the stream passing down the ravine for the projected dressing works, similar to those of the Terrible a short distance below. An engine with a capacity for hoisting a distance of 1,000 feet will soon be at work at the main shaft. All ore obtained from the mines is brought out through the tunnel in cars over the tram railway, and washed, screened, and sorted, and then taken to the mill or ore buyer and sold.

From the above it will be seen that nearly 70 per cent. of the gross receipts of this property in the past has been net profit. Now, that it is being properly opened and is more extensively operated, the yield will be much larger, and may equal, if not exceed, most of its rivals among the leading bullion producers of the district.

Below the Dives and Pelican Mines, the Diamond tunnel is being driven, and is already 1,000 feet long. It will soon cut those lodes at a depth of several hundred feet below present workings.

Last month the Hukill Silver Mine, between Fall River and Idaho, was sold by JOHN M. DUMONT to Chicago parties for $175,000. This is one of the best mines in Colorado, having produced over $300,000 within four years from levels and shafts alone, no stoping having been done. The value of ore standing in the mine is very great. F.

GEORGETOWN, Colorado, May 6, 1876.

HISTORICAL SKETCH OF THE INTERNATIONAL EXHIBITION OF 1876.

Written for the Engineering and Mining Journal, by John A. Wilson, C. E., Philadelphia.

FOR several years the subject of a proper celebration of the centennial of American Independence, has agitated the popular mind, and been more or less discussed in private circles and by the press. The first definite, and what may be called official move was, however, made by the Franklin Institute of the City of Philadelphia. In August, 1869, the Managers of that Society appointed a committee to examine into a proposition to hold an Exhibition in the City of Philadelphia under the auspices of the Institute. After examination it was decided, that, while not expedient for the Franklin Institute to take a leading part, it was highly proper to hold a National Exhibition, that Philadelphia, as the birthplace of American independence and the first capital of the United States, was the proper place for such an Exhibition, and that the Institute would use every effort to further their object.

In accordance with this decision, a memorial—setting forth the action of the Institute and their views on the subject—was presented to the City Councils of Philadelphia, and to the Legislature of the State of Pennsylvania, and committees from those bodies, acting jointly with the Franklin Institute Committee, laid the matter before Congress, the result of which was the passage of an Act of Congress, approved March 3, 1871, "To provide for celebrating the One Hundredth Anniversary of American Independence by holding an International Exhibition of Arts, Manufactures, and Products of the Soil and Mine, in the City of Philadelphia and State of Pennsylvania in the year Eighteen Hundred and Seventy-Six."

In accordance with the provisions of this act, Commissioners were appointed to represent the various States and Territories. The first meeting of the Commissioners was held at Philadelphia on March 4, 1872, when an organization was perfected, committees were appointed, and the Honorable JOSEPH R. HAWLEY of Connecticut was elected President.

Having selected Fairmount Park in the City of Philadelphia, as the site for the Exhibition, and having arranged for raising funds and preparing plans of the proposed buildings, it was deemed advisable to constitute a Central Committee, which should have charge—subject to the control of the Centennial Commission of the erection of the buildings, and of all business matters connected therewith—and an act of Congress was procured incorporating this Central Committee, under the name of the Centennial Board of Finance, with power to issue stock and bonds. From that time forward the Centennial Board of Finance has, subject to the approval of the United States Centennial Commission, attended to all matters relating to the erection of the buildings and preparing the grounds for the Exhibition.

In an enterprise of this kind—especially when there is no Government appropriation—the financial question is generally a serious and perplexing one, and the Centennial Exhibition has been no exception to the rule. The Commission found themselves at the start embarrassed for funds to defray necessary and contingent expenses, and they were forced to apply to the authorities of the city of Philadelphia, who appropriated $50,000 to give immediate relief. On November 21, 1872, books were opened to receive subscriptions to the Centennial stock; agencies for this purpose were established in all the States and Territories, and opportunity was afforded to the public at large to subscribe. Philadelphia naturally took a leading part in the matter, and committees of citizens in every trade, occupation, and interest, were organized for the purpose of obtaining subscriptions to the stock, and the public papers did their best to awaken interest throughout the State in the undertaking. The City of Philadelphia, in her corporate capacity, subscribed $500,000, and the State of Pennsylvania $1,000,000, both amounts to be so expended that the buildings erected with these funds—when the Exhibition was over—should remain as the property of the people of the State, for their improvement and enjoyment. By the month of May, 1873, over $3,000,000 had been secured, and general public interest aroused to the importance of the undertaking.

About this time the Vienna Exhibition was being held, and in order to have all the information possible to guide them, the Centennial authorities sent to Vienna, Messrs. W. P. BLAKE, and HENRY PETTIT, to make a report on that Exhibition.

On April 22, 1873, the organization of the Centennial Board of Finance was perfected, in accordance with their act of incorporation, by the election of a Board of twenty-five Directors, from among the stock-holders. In order to place clearly before our readers the character of the organization, as it may often be referred to in this paper during the progress of the Exhibition, we would say: That the Centennial Commission is the principal authority, having an oversight over everything, and controlling the adoption of plans for grounds and buildings; the establishment of rules and regulations in regard to rates for entrance and admission fees; the rights and privileges of exhibitors, and of the public; no grant or privilege connected with the buildings or grounds, or relating to the Exhibition or Celebration, being allowed, without the consent of the Commission, and all judges and examiners being appointed, and all premiums being awarded by the Commission alone. That the Centennial Board of Finance is the executive arm of the Commission, managing all business matters involving the receipt and expenditure of moneys, issuing its stock, erecting the buildings, disposing of them when the Exhibition is over, and settling up the affairs of the corporation with the stockholders, subject to the oversight and approval of the Commission. The Commission is composed of delegates from each State and Territory, appointed by the President of the United States on the nomination of the Governors of the respective States and Territories, and it is a permanent body. The Board of Finance is a corporation governed by a Board of Directors elected annually by the owners of the Centennial stock.

Having perfected the organization, and provided sufficient funds with which to make a commencement, the next step was to procure plans for the proposed buildings. The views of the Centennial officers were, of course, not by any means fixed as to what was wanted, but it was arranged to invite architects and others, to submit sketches and plans, under an unlimited public competition, for an art gallery, and for a main exhibition building which should consist of two parts—one, the temporary building to be removed when the Exhibition was over, the other to be a permanent structure, which should remain as the "Memorial Hall" after the Exhibition was closed, and the temporary portion removed. Specifications were published, April 1, 1873, giving the general outlines to be followed by those preparing plans, and explaining the nature of the classification of exhibits which the Commission had agreed upon, and for which the buildings must be arranged. Each design was to bear a private mark by which it could be designated, but no name, and each competing party was to furnish a sealed letter, giving his name and address, with the mark he had chosen, and these letters were not to be opened until the designs had been examined and reported on. From these preliminary designs the Commission would select ten which appeared to be the best for their purpose, and the parties furnishing these ten designs would then enter into a second competition, under such changed conditions and specifications as the Commission might deem advisable. The Commission expected to obtain considerable information from this first competition, and very properly anticipated that they might find it advisable to change their views as to arrangements, etc., when they ascertained the probable cost of the buildings, and had definite plans before them.

The 16th of July, 1873, was fixed as the date to which plans would be received, and up to that time forty-three designs were submitted. presenting as many different arrangements for the buildings. Considerable labor was required to examine into all these designs, regard being had to the character and plan of buildings proposed—their cost, and their availability for a proper classification of the exhibits, which must necessarily be arranged with regard both to their character, and to the country from which they came. Ten plans were finally selected, and on August 11th, the conditions for the second competition were announced. The revised plans were received on September 30, 1873, and after examination, the Committee on Plans reported that while all the designs showed great care, skill, and labor, on the part of those offering them, many additional points of great importance had presented themselves in regard to the requirements of the buildings, since the specifications were issued, and that more or less modification would be necessary in *any* design adopted. In accordance, moreover, with the published conditions, the first premium was awarded to Messrs. COLLINS & AUTENREITH of Philadelphia. One great difficulty with the plan selected was its probable great cost, and the great length of time that would be required to execute it, and these considerations induced the committee to materially change its original intentions. Taking into account the nature of the subscription made by the City of Philadelphia, and by the State of Pennsylvania for a "Memorial Building," and the necessity for economizing both time and money, it was decided not to erect a Memorial Hall, and also an Art Gallery, but to construct one building which would answer for both purposes; and to make the Main Exhibition Building, which was to be temporary, a separate structure. The buildings finally decided on were: An Art Gallery, to be the Memorial Hall, a Main Industrial Hall, a Machinery Hall, an Agricultural Hall, and a Conservatory or Horticultural Hall,

with such smaller buildings for specific purposes, as might be found necessary from time to time.

The Committee recommended for the Main Industrial Hall a plan prepared by Messrs. VAUX & RADFORD, of New York, but which had been excluded previously, as not conforming to the published specifications. The condition of the State and city subscription required the appointment of a Board of State Supervisors, who should oversee the expenditure of the funds appropriated for the Memorial Hall, and Messrs. COLLINS & AUTENREITH were requested to prepare plans for that building.

Further revisions were found to be necessary in the plans for the Main Building. Questions arose about the materials for constructing the building—whether it should be of wood or of iron; a further reduction in the estimated cost was deemed necessary; change after change was made, until Mr. HENRY PETTIT, the Consulting Engineer of the Commission, suggested the adoption of a cheaper and more simple style of construction; and, at the request of the Committee, prepared a new plan, in accordance with his views, which plan was finally adopted by the Board of Finance, on June 30, 1874, and approved by the Centennial Commission, on July 4th, following. The contract for this building—to cover 20 acres, and to be completed January 1st, 1876—was awarded to Mr. R. J. DOBBINS, of Philadelphia, for the sum of $1,420,000 Messrs. VAUX & RADFORD retired from the position of architects of the work, about this time, and an arrangement was made with Messrs. HENRY PETTIT and JOSEPH M. WILSON, to act as joint engineers and architects for the Main Building and the Machinery Hall.

The plans for the Memorial Hall, submitted by Messrs. COLLINS & AUTENREITH, met the approval of the Committee, so far as their general features were concerned, but were too costly for the amount of funds at command, and a design, presented by Mr. H. J. SCHWARZMAN, one of the engineers of Fairmount Park, was finally adopted, and the contract for the construction of the same was awarded, on July 4th, 1874, to Mr. R. J. DOBBINS, for the sum of $1,199,273, the building to be completed by Januury 1st, 1876.

The funds at the command of the Commission consisted of the stock subscriptions from individuals and corporations, and the following appropriations:

State of Pennsylvania, for permanent buildings	$1,000,000
City of Philadelphia, " " "	500,000
" " for Conservatory	200,000
" " " Machinery Hall	800,000
State of New Jersey, conditional	100,000
Total Municipal and State appropriations	$2,600,000

The principal officers of the Centennial Organizations are as follows:

CENTENNIAL BOARD OF FINANCE.

President, JOHN WELSH, of Pennsylvania; Vice-President, WILLIAM SELLERS, of Pennsylvania; Secretary and Treasurer, FREDERICK FRALEY, of Pennsylvania; Chairman of the Building Committee, THOMAS COCHRAN, of Pennsylvania.

UNITED STATES CENTENNIAL COMMISSION.

President, Hon. JOSEPH R. HAWLEY, of Connecticut; First Vice-President and Director-General, Hon. A. T. GOSHORN, of Ohio; Secretary, Mr. JOHN L. CAMPBELL, of Indiana; Chairman of the Executive Committee, Hon. D. J. MORRELL, of Pennsylvania. Director-General GOSHORN is the Executive Officer of the Commission, and has his office at No. 903 Walnut Street, Philadelphia, where all business pertaining to the Exhibition is transacted.

We have stated that the Centennial Commission selected Fairmount Park, in the City of Philadelphia, as the site for the Exhibition buildings. A few remarks, explanatory of this location, may not be without interest to our readers. The City of Philadelphia was laid out in the year 1682 by WILLIAM PENN, on the strip of land lying between the Delaware and Schuylkill Rivers, and about five miles northward from the junction of those two streams. The original plot of the city comprised about two square miles of space. The city is located on tide water, about 120 miles, by the course of the Delaware River, from the ocean, and can be reached readily by the largest class of sea-going vessels. One hundred years ago the city contained 5,460 houses, and had a population of 28,042. As the population increased, the surrounding districts became built up, and in 1854 an Act of Consolidation was passed by the State Legislature, which extended the limits of the city over a space 23 miles long, and about 5½ miles broad, covering an area of 129½ square miles. Figuring on the census of 1870, the population in 1876 will be about 825,600, and the number of dwellings 140,000, being an average of about 5 9-10 persons to a house. The thickly inhabited portion of the city covers about 29½ square miles. There are no *tenement* houses in Philadelphia, it is unusual for more than one family to occupy a house, a large proportion of the laboring classes own their own dwellings, and Philadelphia has become known as "The City of Homes." There is a large amount of manufacturing carried on in the city and adjacent districts, the business of iron ship-building is prosecuted on a large scale, and Philadelphia possesses the only line of *American steamships* running to Europe. The following statistics will explain the character and extent of the city's business:

Assessed value of real estate in 1874	$565,819,075
Manufactures, value of, in 1874	$400,000,000
Number of manufacturing establishments in 1870	8 579
Capital employed in 1870	$204,340,637
Value of materials used in 1870	$193,861,297
Value of manufactured products in 1870	$362,484,698
Number of persons employed in 1870	152,550
Wages paid in 1870	$68,647,874
Steam engines in 1870	2,177
Streets opened and in use in 1873 - about	900 miles.
Streets paved and lighted with gas in 1873—about	500 miles.
Street railways in use in 1874—over	231 miles.
Passengers carried on street railways in 1874	78,508 335

Situated in the midst of an exceedingly rich agricultural district, the railroad communications leading from Philadelphia are too numerous to mention in detail. There are a number of local roads for the use of the surrounding country, and the main lines of the United States lead north, south, east, and west, giving connections with Baltimore, Washington, and the South, with Pittsburg and the great West, with the coal and iron districts of the State, and with New York, which is ninety miles distant, and can be reached in a little over two hours time.

Philadelphia obtains her water supply from the rivers Delaware and Schuylkill, from five principal water works, but depends chiefly on the Fairmount Works on the Schuylkill River. Some ten years ago, the city commenced to purchase the lands bordering on the pool from which the Fairmount Water Works draw their supply—so as to prevent the erection of manufacturing establishments on the banks of the Schuylkill, and thus preserve the purity of the water. The grounds thus purchased, and which were placed under the charge of a "Park Commission," have been laid out with drives and walks; the natural beauties of the grounds have been added to by judicious landscape gardening—and the whole now forms a magnificent park of some 3,000 acres in extent, mostly high ground, through which the Schuylkill River flows. In the southern portion of the park, west of the Schuylkill River, and on a plateau overlooking the river and the built-up portion of the city, is the site chosen for the Centennial buildings. Accessible from all directions by street, steam, and passenger railways, and with branch tracks from the main line of the Pennsylvania Railroad running into the buildings, to facilitate the hauling of articles for exhibition, it is difficult to conceive a more convenient or appropriate location for such a purpose.

On July 4, 1873, the grounds set apart for the Exhibition were duly transferred by the Fairmount Park Commission to the Centennial Commission, with all the appropriate formalities due to the occasion, in the presence of the city, State, and national authorities, and an immense concourse of people, and the conditions of the Act of Congress relative to holding the Exhibition having been complied with, the President of the United States issued his proclamation, officially announcing that the Exhibition would be held, and inviting the people of the United States, and of all nations, to take part therein.

We have thus endeavored to give a hasty sketch of the history of the Centennial Exhibition, from the time of its first being brought to the notice of the public, until the actual erection of the buildings was commenced. We propose hereafter to describe the several buildings separately, and in the order in which they have been constructed.

THE SALINEVILLE, OHIO, COAL REGION.

Special Correspondence of the Engineering and Mining Journal.

THE Salineville mining district of Ohio is situated in Columbiana and Carroll Counties (mainly in Columbiana), on both branches of Yellow Creek. There are two seams of coal in course of active development, the big vein and the strip vein. Both seams are accessible by drift mining, and there is neither shaft nor slope in the district. The big vein is from 3 to 6 feet in height, where mined, and is lower down in the coal measures than the strip vein. They are the equivalents of Nos. 6 and 7 of the Ohio Geological Survey. The most easterly mine on Yellow Creek is the Hays Mine, situated two miles south-east of Salineville, on the line of the Cleveland and Pittsburg Railroad. It is opened on the big vein, but the coal is quite thin, scarcely exceeding 3½ feet, caused by the opening being made on the side of an anticlinal arch of the coal strata. The Empire Mine, one-quarter of a mile north-west of Hays, also opened on the big vein, has much thicker coal, varying from 4½ to 5½ feet. This mine, located on the line of the rise of the strata, is fully 50 feet lower than Hays, being opened on a swamp or trough. After crossing the swamp, the coal rises to the south-west, nearly west.

There are seven mines in all operated on the big vein, namely, the Hays and Empire (already mentioned), Farmers, Hays' O. and P., Jones' O. and P., Foster's and Brown's. They extend along Yellow Creek for three and a half miles—Brown's wending across the Columbiana County line into Carroll. The mines of the strip vein are the Rockville and the Hartford, both on Nancy's Fork of Yellow Creek, one mile north of Salineville. The coal is less than 3 feet thick in these mines, but it is of a greatly superior quality to the big vein. All the other openings of the strip vein are located on Yellow Creek, and are the Anderson Mine, the Hussey, the Roberts, the Truesdale, and Brown's. Numerous other openings have been made, but they are not now in course of development. On the south side of Yellow Creek the strip vein is subject to numerous horsebacks—rolls in the roof which come down and cut the seam wholly, or in part, away. These horsebacks are sometimes not more than 10 feet apart, and they may not be encountered for 50 yards, but they are so numerous, and the cost of cutting them is so great, as to make it impossible to recover the good coal of the mines with profit to the mining adventurers.

On the south side of the creek there are no serious horsebacks encountered, and most of the mines of the strip vein are opened on this side. The coal is a little thicker than on Nancy's Fork, exceeding three feet by one or two inches. On the south side of the creek the big vein is seldom found continuous, and all the openings, with one exception, are on the north side. Here there are no troubles, the coal is continuous, of admirable thickness, averaging five feet, with a firm roof and strong floor. So strong is the gray shale stratum forming the roof of the coal, that rooms forty feet in width are, in many cases, worked up their whole length without a single post being used.

The openings which have been made in the north side of Yellow Creek in the big vein, show that this is the edge of a basin in which the coal has been deposited. In working forward to the north, the coal floor rises, at first very gradually, then more rapidly, and as the coal ascends the hill it grows gradually thinner, losing height mainly from the bottom of the seam. Finally the whole height of seam is lost, the coal thinning to a point. The erosions in the valley of Yellow Creek afford an admirable study for the geologist, and demonstrate that the basin in which the coal is found was not always a basin, but that the trough had been scooped out of an irregularly level plain, anterior to the deposition of the coal vegetation. At the turnpike bridge, which crosses Yellow Creek near the Salt works in Salineville, the coal and associated rocks are exposed in the bluffs. The coal rises very rapidly, at least one foot in five, the superincumbent strata also rise, conforming to the pitch of the coal, but the strata below the coal are in no wise affected; they lie perfectly horizontal, or maintain their true dip to the south-east, which is a reverse dip to that of the coal at this point. In the cut on the branch railroad to the mines, at the old tunnel, the coal again takes a hill. In a distance of 100 feet it rises 20 feet; all the strata above the coal pitch as the coal pitches, while the sandstone below the coal maintains its uniformity of level. In the low place of the coal at this point, there is only a foot or two of fireclay between the sandstone and the coal; as the coal takes the hill, the fireclay increases in thickness, and then a wedge of shale appears, until, in the tunnel, the sandstone and coal are apart 12 feet. The very same conditions were found under the coal at this place as are found under coal No. 1 in the Mahoning Valley, as also in the Massillon district and in Jackson County, where that seam presents many irregularities of coal, the hills being, in some instances, 60 feet high. Both seams of coal are disposed in a succession of hills and hollows, but the undulations of one seam do not always conform to the undulations of the other. On the contrary, the coal beds diverge and converge as many as 25 or 30 feet at near intervals. The Hays and Jones Mines of the Ohio and Pennsylvania Coal Company, opened on the south side of Yellow Creek, are both fully 25 feet above the level of that

stream, while not a hundred yards down the creek from the entrance of the lower mine, the seam has dipped to the creek level. In every mine these rolls are encountered, though they are more numerous and more marked in one mine than another.

The northern margin of the basin, or trough which holds the big vein, extends in a sinuous, but marked south-east course following the dip of coal, and the direction of the valley of Yellow Creek from the Carroll County line to the railroad station at Salineville. The three exhausted mines opened on the north side of Yellow Creek, have not produced more than 100,000 tons. They each gave out by the bottom rising, and the coal gradually thinned until it was no longer possible to mine the seam with profit. North of these mines borings have been made, in the hope of finding the coal seam in place, but no coal was found.

The southern margin of the trough holding the big vein, cannot be far south of the Hays Mine, below Salineville. At this mine the coal is found occupying a reverse dip to the true line of dip, the bed is fully 50 feet higher than its true line of lead, were the strata following the natural and uniform dip to the south-east. The coal is here 1½ feet thinner than in the basin or low place, and, as on the northern margin, the loss of height has mainly come from the bottom of the seam. Three miles below Salineville, in a cut of the Cleveland and Pittsburg Railroad, the coal of the big vein has thinned out to a mere trace, and it is there found occupying a higher horizon than at Hays Mine. The railroad does not cross the trough at right angles, but obliquely. How far the trough extends in its line of direction, or whether there be any trough at all east of Salineville, and west of the Carroll County line, I know not. At the Carroll County line, the coal is thinner than at Salineville, but this may be caused by the mines being there opened on the flank of the basin.

The coal of the Hays and Empire Mines has been mistaken for the strip vein by Col. CHARLES WHITTLESEY, of Cleveland. This gentleman made a survey of the Empire property in 1874, and he states, in his report, that he has no doubt as to the coal being the strip vein. I regret to differ with so able a geologist and mining engineer, but I must add, that he is wholly mistaken in his conclusion. The Empire and Hays Mines are both opened in the big vein, and the workings of the Empire, which are approaching the workings of the Farmer Mine, will yet hole through on each other; and, as every one knows that the Farmer Mine is opened on the big vein, this will be the proof of ocular demonstration. But without such proof the coal can be traced from Farmer's to the Empire. Just below the station at Salineville, a water entry of the Farmer Mine has been run out to-day, to drain the workings of water. The strip vein is seen in the hill side, and both can be followed down the creek, the big vein soon plunges under water, and the strip vein comes down within 12 feet of the water's edge, 200 yards east of the railroad bridge. Here the creek takes a rapid turn to the north-west, following the rise of the coal, and bringing the big vein above the water's edge. The entrance of the Empire Mine is still north-west of the creek, and the coal becomes level free—though the mine, by being opened on the east side of the bottom of the trough or swamp dips under water, until the swamp is crossed, when the workings rise in the true line of the pitch of the strata.

Dr. NEWBERRY reports that the Ohio coal field occupies a number of large and regular undulations, resulting from forces which attended the upheaval of the Allegheny Mountains. He locates one of these ridges, or anteclinals, about midway between Salineville and Irondale. These undulations may be due to erosive agencies scooping out troughs in the strata during the coal formation period, long ages before the uplift of the Alleghenies. The geological survey of Ohio shed a flood of light as to the structure, extent, and composition of the Ohio coal field, but it will yet take many years of patient investigation to determine, accurately, all the facts in connection with the coal strata of the State.

A. R.

ELECTRICITY VS. GAS.

From the Builder, April 1st, 1876.

THE Great Northern Railway Company of France has undertaken a series of experiments which seem to indicate the approach of a great revolution in the mode of lighting public buildings and thoroughfares. To judge from the reports recently published, electricity seems destined to eclipse gas altogether. A few weeks ago a three-horse power Gamme machine was employed to light the luggage department of the Paris Great Northern Railway station. This room or hall measures 20,000 cubic feet, and is generally illuminated by twenty-five gas-burners. The new electric light was placed at a distance of 10 meters from the ground, and gave a light of a peculiarly soft character, which rendered the use of the dull globe employed to check the irritating glare of gas quite unnecessary—a fact of some importance as it tends to augment the economy realized by the new system. The light continued to burn the whole evening with great regularity, excepting, of course, when it was purposely lowered. The success attained was so conclusive, if we may believe accounts, that the company intend illuminating the vast structure, containing 300,000 cubic meters of space, where the trains arrive, by the same process. For this purpose electric lanterns, if we may so call them, of exceptional power, will be placed at a height of 20 meters. They will be placed at the four summits of a rectangle, so there will be no shade or dark corner in the whole edifice. The goods station at La Chapelle will also be lighted in a similar manner.

M. TRESCA, an energetic advocate of the electric system, has been able at last to estimate the amount of power required to produce a given quantity of light by the magneto-electric machines. In this respect former experiments had been eminently unsatisfactory, and M. TRESCA gives an exhaustive description of all the difficulties that had to be surmounted, in a report which is inserted in the minutes of the Academy of Science. The results have been obtained chiefly from two machines; the first giving a light equivalent to 1,850 carcel-burners, that consume forty grammes of oil per hour, and the second equal to 302 similar burners. With the former it is easy to read at a distance of 21·50 m., and with the latter at 7·70 m. The reflection, also, from the walls is so strong that persons can read at these distances even when holding the book with its back to the light. From a lamp equal to a hundred burners the same result can be obtained at a distance of five meters. Four electric lamps of this power have been in use during the last year in the factory of Messrs. HEILMANN, DUCOMMUN, & STEINLEN, of Mulhouse, and give a satisfactory light over an area of 1,850 square meters. The most important and crowning fact, however, is the assertion that the electric light is a hundred times less expensive than oil, and fifty times cheaper than gas. Should a prolonged and practical application of the new system prove this startling comparison to be correct, we may look forward to a great change, which will ultimately compel the gas-makers to, at any rate, make a great alteration in their scale of charges, if it should not interfere even more seriously with their interests.

THE MINES OF JAPAN.

By the rules of the English diplomatic service the Secretaries of Her Majesty's Embassies and Legations abroad are expected to make an annual report on some subjects connected with the manufactures, trade, and commerce of the countries in which they reside, and by this means interesting and valuable information is now and then furnished to the public at home, though, owing to the way in which Blue Books are issued, the knowledge thereof is not very widely spread. Last year the Hon. F. R. PLUNKETT, of the Legation at Yedo, at the instance of his chief, Sir HARRY S. PARKES, selected for his subject the "Mines of Japan," and as this subject is a novel one, of which nothing, or next to nothing, is known in this country, we take an early opportunity of laying before our readers the following notes condensed from Mr. PLUNKETT's report, which has recently been presented to Parliament.

In the present unsurveyed state of Japan, it is impossible to come to any perfect satisfactory conclusion with regard to its mining capabilities, but still it is certain that in almost every portion of the empire minerals of various kinds are found, and it is equally certain that in numberless parts of the country mines have been worked with more or less success for centuries. At present many of these so called mines produce only a few pounds of ore in the course of the year, and the question to be solved is how far are these ores susceptible of being worked to advantage? In his endeavor to furnish information for the solution of this question, Mr. PLUNKETT owns his indebtedness to the Chief Government Mining Engineer in Japan, Mr. HOCHSTAETTER GODFREY, who, by the special instructions of the Minister of Public Works, placed at his disposal a number of papers and returns not before communicated to anyone outside the department.

In almost every portion of Japan, writes Mr. PLUNKETT, are found ores of some kind, and there is scarcely a district in which there are not traces of mines having been worked; most of these, however, are now either abandoned or are worked in a very slovenly manner. As yet Europeans have exercised but little influence on Japanese mines, and the methods still pursued are, with one or two exceptions, almost the same as those which were used in olden times. With the one exception of Takashima, of which we shall speak more particularly later on, mines in Japan are still attacked exclusively by adits, for the Japanese never sink a shaft, and they have nothing more powerful than bamboo pumps for lifting water, it is easily conceivable how soon it gets the upper hand. Most of the works are of the most paltry description, for the natives will not invest much capital in mines; they burrow for ore wherever they suspect its existence, without system or forethought. A hole is dug in the side of a hill, and if ore is found the work goes on; if not, it is soon abandoned, and a hole is dug elsewhere, with a similar result. The two openings thus made, although perhaps not one-half ton of ore has been extracted from either of them, are called mines, and help to swell the grand lists of mines which are so constantly palmed off on travelers in the interior, and encourage the idea that Japan is a veritable El Dorado.

The following table is abridged from an estimate of the mineral production of Japan in 1874, prepared at the Mining Department:

Mineral.	Total produced.	Total value.
Coal	390,000 tons.	£398,125 0 0
Copper	3,000 "	183,750 0 0
Silver	21,665 lbs. Av.	79,625 0 0
Gold	833 " "	51,041 13 4
Iron	5,000 tons.	30,625 0 0
Petroleum	275.825 gallons.	4,695 16 8
Lead	185 tons.	4,343 12 11
Tin	7½ tons.	612 10 0
Total		£752,818 12 11

It is unnecessary to comment on this table, but we may remark that it does not include sulphur, antimony, quicksilver, salt, etc., of which no estimate was procurable, but the amount produced is believed not to have been large.

Having premised this much, we come to the body of Mr. PLUNKETT's report, which, for the sake of clearness, he divides into five heads, taking the principal minerals according to their relative importance, viz.: (1) Coal mines and oil wells; (2) copper mines; (3) silver and gold mines; (4) iron mines; and (5) lead and tin mines.

1.—COAL MINES, AND OIL WELLS.

Coal is found in many parts of Japan, but the principal coal fields are situated in the neighborhood of the treaty port of Nagasaki—in fact, more than three-quarters of the coal obtained in Japan comes from that one district. The best developed and most productive of all the Japanese coal mines, says Mr. PLUNKETT, is undoubtedly in the small island of Takashima, about 10 miles from Nagasaki. It is coal of old formation, and is pronounced to be almost equal to English North Country coal; it contains only about 8½ per cent. of ash. Up to 1868 this mine produced but a small quantity of coal, owing to the defective system of mining pursued by the natives—working the seam from its highest level, where the coal strata crop up to the surface, and following it downwards in the direction of its dip. In that year Messrs. GLOVER & Co. obtained a joint lease of the property, in partnership with the Prince of Hizen, and sank a shaft of 150 ft. deep on the opposite side of the island, where they struck the eight-feet seam. The Government afterwards took it over, and a short time ago sold it to a Japanese company for a little over 112,000*l*. In 1869 this mine only produced about 35,000 tons, which increased in 1874 to 72,428 tons of saleable coal, and at the date of Mr. PLUNKETT's report it was yielding 500 tons a day.

The next district in importance is Karatsu, on the mainland of Kiushiu, which, though not equal to the Takashima coal, is far superior to most of that which is found on the main island. We defer speaking of the mines in this district for the present, and we also pass over the others alluded to in the report, as they are relatively of less importance than those spoken of.

The following are analyses by the chemist and metallurgist of the Imperial Mint of specimens of Japanese coal used in the copper refinery and other metallurgical operations of his department:—

	1.	2.	3.	4.	5.
Ash	12·760	6·487	10·595	9·877	9·557
Sulphur	·654	·435	·461	·588	·383

The cost of production varies a good deal according to places, but a competent judge in these matters considers that it may be put down on an average at 6s. 1½d. to 10s. 3½d. per ton, but in one case it has risen to 12s. 3d. per ton. A peculiar source of expense to coal owners in Japan is the use of the straw bags, holding about 133½ lb., in which the coal is packed before it can be moved either on horseback or by coolie.

Petroleum is found in considerable quantities in the neighborhood of Niigata. In

one place 80 pits have been sunk, one of which yields from 16 to 20 gallons a day. The quality of the oil is said to be good, and it is thought that with judicious management the supply might be greatly increased. The oil is refined usually by single distillation, 16 gallons of raw oil giving 14 gallons of refined oil. Sulphuric acid was not used till after Mr. PLUNKETT's report was drawn up on account of its high price.

2.—COPPER MINES.

Copper is found in numberless parts of Japan, and is usually of excellent quality. When properly refined it takes a foremost place amongst the various kinds of commercial copper, being almost invariably free from antimony, sulphur, etc. The copper ores usually worked in Japan yield from 2½ to 12 per per cent. of copper, although richer specimens are also sometimes found. The finest copper mines are considered to be those of Ani, in the district of Akita, the output of which in 1872 was—Fine copper, 395 tons; lead, 106 tons; and silver, 1,191 lb. Av. A singular peculiarity of these mines is that while the veins running east to west are rich in copper and poor in lead, exactly the reverse is the case in those which run north to south.

The following table of the daily wages paid at these mines is instructive; the sums named include not only the money paid, but also the value of the food (about 2 lb. of rice) given to each workman :—

	Men.	Women.
Head coolies	11·4c.	—
Miners	10·0	—
Trammers	7·4	7·4c.
Surface wood carriers	9·0	—
Washing	11·5	8·4
Calcining	8·9	7·4
Smelting	8·0	—
Powdering slag	6·8	6·8
Powdering ore	—	5·2
Surface carriers	10·9	10·9

The following is an abridgment of an account given by the metallurgist (Mr. GOWLAND) of the Imperial Mint, at Osaka, of some copper mines in Yamato : This may be taken as a specimen of a Japanese mine of the best class, being worked by native methods, producing from 15 to 20 tons of crude metallic copper per month, and giving large profits. It is situated in a narrow valley, in the midst of mountains, and at present two passes of nearly 3,000 ft. are crossed to gain access to it. So narrow is the valley, and so steep the inclination of its sides, that there is no level ground, or ground which could be made so, within nearly half a mile of the mine entrance, upon which European furnaces could be built. All the present dressing houses, furnaces, etc., are perched upon the slopes, supported by built-up foundations. The vein consists of calc-spar, quartz, magnetic pyrites, iron pyrites, and copper pyrites, the pyritous part varying in width from 18 in, to 3 ft. or more, occasionally being split into two veins, and often ending abruptly. The vein has but a comparatively slight dip, and is worked by several levels, one lower level being made use of as an adit. The levels are driven and the ore removed by gunpowder, the broken down ore being carried to the surface on the backs of men and women. The ore, on arriving at the surface, is broken up with hammers by hand, the harder and larger pieces being subjected to a preliminary calcination in a large pit, with wood for fuel. After remaining in the pit for about five days, it is raked out through a hole in the side, and is then seen to be full of cracks, and is easily broken. The breaking up by hand labor requires the employment of a large number of men and women, and appears to be a slow and costly operation. The ore having been broken up into pieces about the size of walnuts, is placed with a sufficiency of wood in kilns 5 ft square, with walls rudely built of stone, and lined with clay. The calcination lasts 15 days, but is of a very unsatisfactory character, much of the ore undergoing but slight change in the process. The furnace consists of a hemispherical cavity in the ground (1 ft. 9 in. in diameter, by 14 in. deep) lined with refractory clay, furnished with two bellows at the back and one in front, also with a thick semicircular lid of clay half covering it. The charge weighs about 1,224 lb. avoirdupois, and is introduced in three parts. The fuel used is charcoal. The furnace having been repaired and well dried after the "heat" of the previous day, is lighted by introducing some burning embers, together with fresh charcoal, and over this charcoal a third part of the charge of ore is piled, forming a heap : the blast from the bellows behind is started, and soon jets of flame of carbonic oxide make their appearance over the whole surface of the heap, which, gradually melting, subsides into the furnace; the slag is then removed, and another portion of charcoal and ore piled up as before. When the whole charge has been melted down in this way, the slag is skimmed off, after which the front bellows is brought into action, the blast of air being directed upon the surface of the molten regulus and copper, and a little charcoal added at the side from time to time to keep up the heat. This part of the process is analogous to the "roasting" of the Welsh method of smelting, and is intended to remove sulphur as sulphurous acid, and so reduce the regulus to metallic copper. In ten hours the charge is worked off, and the copper lifted out in more or less circular cakes by throwing water on its surface, and raising the solidified crust with an iron tool. The slags produced by the melting down are usually very free from copper, in many cases as much so as similar European slags; they are thrown away. The slag, however, produced during the latter part of the process, when the front bellows is used, is very rich in copper; it is carefully collected, and is smelted with the next day's charge.

This process, says Mr. GOWLAND, has many advantages for a country like Japan, where the means of intercommunication are so bad, and coal is, therefore, not available for fuel. Everything required can be made at the mine, and sufficiently refractory clay is found almost everywhere. By the native processes above described copper can be produced in Japan, with the investment of less capital, and at less cost than probably in any other country in the world.

The following analysis by Mr. GOWLAND of a crude copper from one of the mines may be taken as fairly representing the average composition of good qualities of Japanese crude copper :—

Copper	98·940	Arsenic	Trace
Lead	Trace	Antimony	Absent
Sulphur	·947		
Iron	·101	Total	99·988
Silver	Trace		

Another analysis of so-called copper is interesting :—

Copper	58·872	Arsenic	Faint trace
Lead	39·283	Antimony	Absent
Silver	·185		
Iron	·083	Total	100·058
Sulphur	1·635		

Mr. PLUNKETT draws particular attention to a remark of Mr. GOWLAND's, in his report to the Master of the Mint at Osaka, that "Japanese copper, when properly selected and refined should be of high value for electro-telegraphic purposes, where freedom from arsenic and antimony is especially required, these metals, when present, reducing the electro-conductivity to a serious extent."

The chief part of the copper produced in Japan is exported, and the principal foreign market for it is Calcutta, where it is supposed to be used for household utensils. At the time of Mr. PLUNKETT's report the price of Japanese copper at Yokohama was about £3 19s. 2d. ($19) per picul of 133⅓ lb, and including freight, insurance, and commission, this would come to about £80 per ton delivered in London. The following, it may be added, is an estimate of the average cost of producing a ton of Japanese copper according to the present native methods—£38 15s. 10d. ($190) per ton, made up thus :—

	Per cent.
Cost of ore	23
Explorations	3
Subsequent treatment of ores—Labor	46
Materials	18
Superintendence	10=100

In this statement the freight to a seaport or other market is not included.

TO BE CONTINUED.

THE SILVER PRODUCT OF THE COMSTOCK LODE.

WE take from the New York *Tribune* of the 20th May, the following letter by Mr. JAMES D. HAGUE, giving, upon good authority, the approximate value of gold and silver, produced by the Comstock Lode since 1860, when its mines were first opened :

In an article entitled "The Silver Question," published in the New York *Tribune* of March 21, the statement is made that the Comstock Lode has already produced "more than $275,000,000" in silver. As the silver question is attracting a good deal of attention, and is likely to be the subject of much discussion in future, it is worth some trouble to obtain at the outset correct data concernin gthe production of that metal. Permit me, therefore, to offer a statement of the value of the gold and silver product of the Comstock Lode from the date of its discovery to the beginning of the present year. This statement is mainy-based on three sources of information. One is the record of the express company whose business it is to carry the products of the mines to market; another is the carefully kept records of the principal mines from which the bull lion has been produced, and a third is the record of the county officer whose duty is to learn the value of the bullion produced from all sources, for the purpose of taxation. Relying chiefly on these sources of information, the product of the lode may be stated as follows.

1860	$100,000	1869	$7,405,578
1861	2,000,000	1870	8,254,272
1862	6,000,000	1871	10,644,704
1863	12,400,000	1872	13,159,093
1864	16,000,000	1873	23,216,062
1865	16,000,000	1874	23,051,496
1866	11,709,100	1875	24,885,617
1867	13,738,618		
1868	8,479,769	Total	$197,074,309

In round figures it may be said, with a very close approximation to truth, that the value of the bullion product of the lode from 1860 to 1875 inclusive is $200,000,000. If from this amount the value of the gold contained in it be subtracted, the remainder will show the value of the silver. In the earlier years of production the proportion of gold contained in the bullion was higher than it now is. Subsequently, for several years, during the prosperous days of the GOULD & CURRY, SAVAGE, HALE & NORCROSS, and Chollar-Potosi Mines, the value of the bullion was about one-third in gold and two-thirds in silver. In the product of the Belcher and Crown Point bonanza (about $50,000,000) the value of the gold was about one-half. In the great product of the Consolidated Virginia the gold is about 42 per cent. of the value. The average value of the gold in the entire product is therefore not far from 40 per cent. of the whole. Accordingly, the value of the silver product of the lode, from the outset to the beginning of the present year, instead of $275,000,000 is about $120,000,000.

JAMES D. HAGUE.

No. 240 MONTGOMERY STREET, SAN FRANCISCO, March 31, 1876.

NOTES.

MODE OF RENDERING BLASTING POWDER SAFE.—ROBERTS.—It is proposed to mix some hydroscopic salt with the dynamite or other explosive, which, by absorption of water, will prevent the powder from becoming ignited accidentally, and yet will not prevent it from being exploded by a charge of fulminate.

THE CONVERSAZIONE HELD THURSDAY EVENING, 18th inst., at the Rooms of the Institute of Mining Engineers, in Philadelphia, was very interesting and quite largely attended, some 55 being present. Prof. J. P. LESLEY made some remarks on Pennsylvania Geology. Among the Geologists present were Dr. HECTOR, Director of the Geol. Survey of New Zealand; Prof. E. T. COX, of Indiana; Prof. E. T. SWEET, of Wisconsin; E. C. GANJOT, of Michigan; Prof. PRIME, of Penn., and a number of others.

EXPLOSION OF FIRE DAMP IN THE MIDLOTHIAN COLLIERY, VA.—An explosion of gas which resulted in the loss of eight or ten lives occurred in this mine on the 20th inst. The telegraph report attributed the accident to penuriousness on the part of the owners—a cause so common as to bear an air of probabiiity—but we have before us a description of this mine communicated to the Institute of Mining Engineers at the Washington Meeting by Mr. HEINRICH, which is at variance with this theory, and, as we understand, a full investigation is to be made, and its results are promised to us, we refrain from expressing an opinion at present. It is very evident that some one is to blame, for such "accidents" are by no means unavoidable. We will shortly publish the description of the mine, referred to above, and with it an account of this frightful explosion and its cause.

PETROLEUM PRODUCTION FOR MARCH AND APRIL, 1876.—

	March. 31 Days.	April. 30 Days.	Increase.	Decrease.
Stock on hand at the wells, barrels	155,820	161,202	5,382	
Production for the month	718,177	701,490		16,687
Daily production	23,167	23,383	216	
Producing wells	3,670	3,772	102	
Drilling wells	230	267	37	
Stock in iron tanks and pipe lines	3,566,196	3,623,070	56,874	
Stock held by refiners	107,234	116,431	9,197	
Total stock	3,829,250	3,900,703	71,453	
Total shipments	623,762	630,037	6,275	

—*Stowell's Reporter.*

COAL AND IRON IN SILESIA.—We find, in a recent report upon the trade and com-

merce of Silesia, that the coal production in 1873 amounted to 201,276,593 cwts., of a value of 27,709, 327 thalers. In the province there were 170 mines, employing 44,934 workmen. It is also affirmed that, in consequence of other production, the trade was very bad in 1874, and at many places British coals could not be competed with. In 1873 the quantity of iron ore produced was 11,823,678 cwts., of a value of 942,647 thalers. 106 mines were being worked, employing 3,429 workmen.

THE MANUFACTURE OF BRICKS FROM SLAG at Osnabrück, and other applications of slag.—LÜRMAN.—The results of some tests on the tenacity of the bricks is given, also an account, year by year, from 1866 to 1874. The amounts of brick made have increased steadily from 345,000 in 1866 to 5,760,000 in 1874. Experiments show that these bricks will serve for chimney linings, if not placed too close to the fire, as they will stand heating to low red heat and cooling again without losing any of their strength. More porous than clay bricks, they take longer to absorb water when laid in it. The mode of making "slag wool," so-called, is described.

REDUCING IRON ORES IN THE BESSEMER CONVERTER.—R. M. DALON.—Recommendations derived from experiments made by REDNER at Cruzot, France. The introduction of ½ ton of pure iron ore into a charge of 7 tons of iron, toward the end of the operation, gave an excellent quality of steel, with a clear slag containing scarcely any iron. A better mode has been found to be packing the iron ore around the sides of the converter, as fettling and sintering it somewhat together by a small charge of coke before running in the iron. One ton of ore to 6 or 7 of iron may be used. The advantages claimed are: 1st, increased cheapness of the steel; 2d, increased purity of the steel; 3d, saving in time and fuel; 4th, possibility of using an iron poor in silicon. The ore used should not contain over 0·07 per cent. of phosphorus.

THE LAW ON MINING CROSS LODES.—HON. L. K. LIPPINCOTT, Acting Commissioner of the General Land Office, recently made the following decision in a case that arose in Boulder County, Colorado: A patent for the American mine was applied for and the owner of the Bull-of-the-Woods, a cross lode, filed an adverse claim. The first named mine was first located. A party has a right to a patent for the number of feet along his lode or vein to which he has the local title, upon full compliance with the law and instructions; provided, however, that where another lode crosses, the ore at the space of intersection of the two lodes belongs to the party who owns the prior location of the two. The law clearly refers to cross lodes, and provides that the ore at the crossing of the two lodes shall belong to the first valid location, and hence where a patent issues for a mining claim which crosses one already patented, the surface ground in conflict is excepted from the second patent, but the subsequent patentee has the right, under his patent, to his lode for the distance patented, with the proviso hereinbefore referred to, viz.: that the ore at the space of intersection of the cross lodes shall belong to the prior location.

MINING NOTES FROM COLORADO AND UTAH.

COLORADO.—From the *Colorado Miner* of May 20, we take the following:

Nuckolls.—The main shaft in this mine is now down 175 feet. The pay-streak is increasing in value, and, from present indications, a large body of ore will soon be struck.

Silver Plume Concentrating Company.—This mill is now running night and day, with a full supply of ore. Forty tons of concentrated material were sold last week.

Young America.—This mine is once more in excellent pay. Eight years ago over $25,000 was taken from workings near the surface, but after going down 200 feet, the ore-vein, though large and well-defined, was poor in silver, and the owners in disgust, let the property lie idle until this year. Some miners, however, had the faith and courage to go deeper, and they have found a rich reward.

Baxter.—About twelve tons of ore have been brought down this week. The first-class ore averages 450 oz., and the second class 250 oz. to the ton. The Baxter's contribution to the Centennial, one ton of first-class ore, has gone on to Philadelphia.

Atlantic.—During the last week, a little over five and one-half tons of ore have been sold from this mine. By the returns before us, the first-class has run 947 and 770 oz. and the second-class 435, 425 and 552 oz. silver per ton. For this ore the owners and lessees received $2,890 cash. The expenses of mining, powder, fuse, and packing, for the same time were $1,245, in which is included the cost of a new ore-house, blacksmith shop, and other permanent improvements, some $350. We commend this item to those who doubt that mining, as a legitimate business, pays.

Tunnel Lode Number Five Company.—This company will sink a shaft 1,000 feet deeper on the Colorado Central or Number Five Lode, from its point of intersection in the Marshall Tunnel. The shaft which is to solve the problem of deep mining in this county, is 5x14 feet, divided into two compartments, with strong ladderways, and is now going deeper every hour at a rapid rate. Veins of scattered ore, showing ruby and brittle silver, are found in sinking.

Park County.—The large quantities of ore which have been accumulating at the mines during the winter, will shortly commence moving to the smelting works. The roads to the various districts are about opening. Many of the mines have been working mainly on development, and will now take out and ship the ore opened.

Dolly Varden.—The ore now being produced is of a better quality than usual, and the appearance of the mine is in fine development. The Hiawatha, Russia, Security, Lone Star, and London are working steadily, and in good pay.

Horseshoe.—A blast-furnace is being erected on this mine, the machinery for the same having arrived. Chlorination works are being put up at the mouth of Mosquito Gulch.

The Grose Concentration Works are in process of erection.

Low Grade Ore.—Three new one man-power jigging machines have been erected lately on some mines in Fremont County, for the purpose of reducing low grade ore. This is a very simple and effective process of concentrating ore, and, we judge, a lucrative one, from the fact that the owner of one of the works gives twenty-five per cent. of the proceeds after reducing, pays eight dollars per ton for crushing, and, with the labor of one man, with other incidental expenses to come out of the gross proceeds. The owners of these machines are not very communicative on the subject, hence, we conclude, as they keep constantly at work, that it is a lucrative business. About four tons of low grade ore are reduced to one.

The Colorado Dressing and Smelting Works at Golden, has turned out about three hundred tons of roasted ore during the last few weeks. Both roasting furnaces will be kept in full operation as soon as the smelting furnace starts. The capacity of the new smelting furnace is fifteen tons per day. Before the end of the month this company will be shipping matte. The ore will not be reduced to bullion at these works, but the matte will be sold to other parties who will perform that part of the process. The Fairmount Mine, Idaho, and the Osceola and Grand View mines in the Sunshine District, are shipping to these works.

San Juan County.—New reduction works are being erected at Lake City, and a new stamp mill at the Little Annie Mine, in Summit mining district. Two stamp mills are already in successful operation in Summit district. Over 2,000 lodes have been recorded at Silverton, in this county, and an equal number in each of the counties of Hinsdale and Rio Grande. The report of the United States Mineral Surveyor, E. B. SHERMAN, says with regard to the San Juan country: 'Forty lodes will be available for work within a distance of 1,100 feet. Some high assays have been made from ore taken from these lodes, but they are from selected specimens, and it is not to be supposed that the whole pay streaks will run so high. But large quantities of high grade of ore can be mined. From the present workings fifty tons of first-class ore can be taken out daily, and this ore will run at least 100 ounces. The cost of mining this quantity of ore will not exceed $400. A tunnel of 1,100 feet will cut the most distant of these lodes at a depth of 800 feet and the entire property can then be developed with shafting or hoisting. Already the tunnel has been pushed ahead 170 feet cutting the Topeka, Manitou, and Silver Wing, the last at a depth of seventy-five feet, and large quantities of ore have been taken out that, without sorting, will run $200 per ton. Between the three lodes mentioned are ten blind leads, that carry not less than twenty-six inches each of pay streaks."

UTAH.—From the *Salt Lake Tribune* of the 20th inst. we take the following, with reference to the condition of mines in the Little Cottonwood district:

The Flagstaff is not shipping at present, as the Smelting Works have been shut down for repairs; but the mine has about sixty-five men running drifts, tunnels, etc., and getting the mine in shape for a good season's run. It has plenty of ore in sight, and several fine and large bodies have recently been struck.

The North Star is working a small force, and is taking out quite a quantity of good ore.

The Prince of Wales is still taking out considerable ore, and will push things lively as soon as the roads again become passable, so that the ore can be taken to market.

The Grizzly is taking out plenty of ore, and has a great deal in sight. It is rumored that this mine will soon be working one hundred men.

The Equitable is working a few men, but the surface water is very bad, and they cannot push it very lively till the snow melts.

The Fuller has shut down, as the water became so bad that it was impossible to go any further without hoisting works, or some mode of drainage. Last week they made a survey of a tunnel that will tap the mine at a depth of twelve hundred feet. By running twenty-eight hundred feet the course of the tunnel will cut several ore veins, and will do much towards developing the lower end of Emma Hill.

The Frederick is working a moderate force on the mine, and is also starting a tunnel that will tap it at a great depth.

The Bay City tunnel is pounding away day and night, but don't throw any of that big body of rich ore in sight. It is quite certain, however, that there is plenty of ore in the mine.

The Howland is moving along, and is said to be looking very encouraging.

The Irish Tunnel is still moving ahead, and working quite a force, and, it is said, meeting with good results.

Ontario Mine. During the week ending the 13th instant, WELLS, FARGO & Co. have received and shipped from the Ontario Mine, nineteen bars of bullion, 2,393 pounds, valued at $31,784.74.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending May 20.

Tons of 2,240 lb.	1876. Week.	1876. Year.*	1875. Week.	1875. Year.*
Wyoming Region.				
D. and H. Canal Co	51,147	745,176	71,646	1,116,537
D. L. and W. RR. Co.	28,797	476,324	77,170	1,052,913
Penn. Coal Co	22,549	347,636	27,832	445,709
L. V. RR. Co.	14,528	379,805	8,902	335,681
P. and N. Y. RR. Co.	313	9,395	3,410	33,711
C. RR. of N. J	40,530	425,600	13,252	145,922
Penn. Canal	14,795	65,365	273	636
	172,659	2,398,701	207,485	3,131,109
Lehigh Region.				
L. V. RR. Co	38,425	719,937	7,322	149,377
C. RR. of N. J	37,448	383,263	89	5,605
D. H. and W. B. RR.	511	13,309	1,613	17,478
	76,384	1,116,509	9,024	172,460
Schuylkill Region.				
P. and R. R. RR. Co.	119,785	1,359,322	38,220	439,274
Shamokin & Lykens Val.	24,324	261,738	27,542	356,007
	144,109	1,621,060	65,762	795,281
Sullivan Region.				
Sul. and Erie RR. Co.	1,843	22,539	—	5,419
Total	394,995	5,158,809	282,271	4,104,269
Increase	112,724	1,054,540	—	—
Decrease	—	—	—	—

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

The receipts at Port Richmond for the week were 52,000 tons, shipments 44,000 tons, and balance on hand 182,500 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Piedmont Railroads amounts to 182,216 tons, as compared with the corresponding period in 1875.

Perth Amboy business:

	Tons.
Received for the week	4,950
Shipped for the week	12,475
On hand May 20	90,194

Freights to New York, 40c.; Boston, 1.05; New Haven, 65c.; Hartford, $1 00.

Receipts of Coal at Boston, for week ending May 19, and years from September 1st, 1874 and 1875.

From	Week. Tons.	Previously. 1876. Tons.	1875. Tons.
Alexandria and Georgetown	1,980	60,620	53,026
Philadelphia	11,647	449,076	302,785
Baltimore	7,535	90,726	109,675
Other places	7,225	206,497	149,430
Great Britain	102	4,111	2,124
Nova Scotia	—	12,851	15 378

Belvidere Delaware RR, report.	Week.	Year 1876.	Year 1875.
Receipts of coal at Coal Port (Trenton)	2,199	54,336	206
" " " South Amboy	3,061	171,931	19,702
Shipments at Coal Port (Trenton)	—	51,346	196
" South Amboy	7,306	151,089	97,398

Shipments of Coal from Richmond, from January 1, 1876, to May 20, 1876, inclusive:

	Week.	Year.
By Cannellton Coal Company	1,159	10,121
" Peytona " "	362	5,171
" Blacksburg " "	—	3,520
" Coal Valley " "	191	3,624
" Other " "	—	3,625
Total tons	1,712	26,061

The Production of Coke for the week ending May 7.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	..
Alleghany Region	..	..
West Penn. RR.	702	16,708
Southwest Penn. RR.	10,587	165,109
Penn. & Westmoreland Region, Penn. RR.	1,928	13,491
Pittsburgh, Penn. RR.	2,897	72,292
Total	16,114	267,600

The Production of Bituminous Coal for the week ending May 20, was as follows:

Tons of 2,000 lb., except where otherwise designated.

Cumberland Region, Md.	Week, Tons.	Year, Tons.
Tons of 2,240 lb	42,928	519,127
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	6,727	129,676
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,101	62,345
*East Broad Top	1,460	26,504
Clearfield Region, Pa.		
*Snow Shoe	874	20,033
*Tyrone and Clearfield	24,797	386,676
Allegheny Region, Pa.		
*Pennsylvania RR	4,896	75,123
Pittsburgh Region, Pa.		
*West Penn. RR	3,371	76,743
*Southwest Penn. RR	1,147	19,795
*Penn. & Westmoreland gas coal, Pa. RR.	16,711	249,209
*Pennsylvania RR.	8,226	113,016

* For the week ending May 7.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 26, 1876.

Anthracite.

The condition of trade shows no change. Buyers are only purchasing for immediate wants, and as the demand for domestic purposes is very light, as is always the case at this season of the year, and a great many mills in the East are either closed or working but part time, there is comparatively little coal being moved. Stocks with the mining companies have increased until, if we include what is in boats and cars, there are fully 1,000,000 tons awaiting sale. The business doing is almost entirely at concessions. If a person were to enter the market today and propose to take a large quantity of coal at circular rates, he would bring upon himself the suspicion of being about ready to go into bankruptcy.

It has been announced that prices will be advanced

5c. per ton for the month of June. If buyers had confidence in prices being maintained, there might be some inducement for those who have surplus capital to enter the market; but for those who find difficulty in meeting their payments there is no inducement, the advances being but little more than an equivalent of the interest on money.

If buyers were to enter the market and demand large quantities of coal, it is doubtful if they would be accommodated; except in cases where the credit is of the very highest order.

During the week the failure of J. D. HEISENRUTTEL for about $150,000 was announced. C. A. BLAKE, of Buffalo, formerly of Trinity Building, announce a meeting of his creditors, at his office, on the 1st prox. One of the large companies is said to have lost by failures during the last two weeks, about $80,000.

In the face of the large stocks of coal and continued production, it is not strange that trade is demoralized. From present indications, the position of the companies would be very much improved, and a much better tone be given to trade if about five weeks, during June and July, were to be devoted by their employees to the Centennial or other recreation than that of mining coal. The coal-carrying companies are slow to believe that they must reduce transportation rates, as all other things are being reduced, and the longer they resist that reduction and maintain the price of anthracite, the more do they lessen its consumption, and, at the same time, their ability to make a concession that is necessary and inevitable.

Since writing the above we learn that the Combination had a meeting at the office of the Delaware and Hudson Canal Company, in this city, this afternoon; that the proceedings were quite harmonious; that all tonnage questions were fully adjusted, and the organization again assumes the appearance of being "as strong as ever." It was resolved to totally suspend mining operations on the 5th of June and continue the suspension during alternate weeks until the end of July. This should place the coal trade in a much better position, and should tend to bring out buyers.

Bituminous.

We note some further steamship business for the Clearfield Region: Messrs. BERWIND, WHITE & Co. have closed contracts for supplying their "Eureka" coal until July 1, 1877, to the "White Cross" and the Netherland-American Steam Navigation Company's lines of steamships. It is certainly a hard blow to the mining companies in the Cumberland District, and, in fact, to the whole State of Maryland, to see this very important branch of trade gradually, but surely, taken away from them by their Pennsylvania rivals. There is one redeeming feature to it, however; the indignation of the whole people of the State will become so great that the impositions now practiced by the company, owning the only outlets from the coalfield, must be removed. Already the shipments of coal over the Cumberland Branch and Cumberland and Pennsylvania Railroads show a falling off of 182,215 tons, as compared with 1875; the decrease for last week alone having been 25,582 tons. In the deliveries to other routes of transportation the Chesapeake and Ohio Canal shows a falling off of 24,487 tons; the Pennsylvania State line, 25,985; and the Baltimore and Ohio Railroad, 131,743 tons. This foreshadows a falling off of fully 250,000 tons in shipments of Cumberland coal over the Baltimore and Ohio Railroad this year, as compared with 1875, and as there was a falling off of about the same amount in 1875 as compared with 1874, it will make a total reduction of some 500,000 tons to this road in two years time, in one particular item of business; a very serious loss in these hard times. This road has made several serious mistakes in regulating its coal business during the past two years, but that of endorsing the present management of the Consolidation Coal Company is likely to prove the most disastrous. While the Cumberland Region continues to lose in tonnage, the Clearfield is constantly gaining, showing, according to the latest reports a gain of over 100,000 tons, as compared with the corresponding period of 1875.

There are rumors that the Baltimore and Ohio Railroad has allowed drawbacks on freights to some of the Cumberland Companies. This is indicated by some very low prices for shipment from Baltimore. There is also a rumor that this road will soon openly reduce its freights.

Foreign and Gas Coals.—There is no new business doing in domestic gas coals, although considerable is being shipped on orders placed early in the season. The brig *Nellie* arrived here on the 25th inst., with 437 tons of "Black House" (Cow Bay) coal consigned to Messrs. PERKINS & JOB, being the first receipt of Provincial coal this year. This coal can be delivered here at a shade under $5 currency, per ton.

NOVA SCOTIA.—According to the reports from Nova Scotia, there is no activity at any of the Provincial coal mines. The drift ice, even as late as the middle of May, seriously interfering with navigation. In Pictou County the Acadia colliery is mining about 300 tons a day; the Drummond irregularly having a stock on hand; the Albion also only working when tonnage is available. The Vale colliery has closed its pits for two months having sufficient on hand to supply the probable requirements of that time. In Cape Breton the season has not yet opened, only an occasional cargo having been shipped. While it is hardly expected, even by the most sanguine, that the trade of the former county will equal that of last year, little hopes are entertained of any improvement in the trade of Cape Breton. Freights have opened lower this year, steamers accepting contracts for the season at $2 12½ from Pictou to Montreal. But as coal is brought out from Great Britain at 7/ per ton the low inter-Provincial freights will not aid the trade.

**** Wholesale Prices of Anthracite Coal for May, f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.***

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna and Scranton at Hoboken and Weehawken	4 65	4 75	4 85	4 95	5 55	4 85
Pittston at Newburg	4 50	4 60	4 70	4 80	5 40	4 70
Wilkesbarre at Port Johnston	4 65	4 75	4 85	4 95	5 55	4 75
Plymouth, R. A.	....	....	4 85	5 05	5 65	4 85
Susque. Coal Co. at Amboy W.A.	4 65	4 75	4 85	5 05	5 55	4 85
Kingston at Hoboken	4 65	4 75	4 85	5 05	5 55	4 85
Lehigh Coals.						
Old Company at Port Johnston	5 15	....	4 95	4 95	5 55	4 85
Old Company's Room Run "	5 15	....	4 95	4 95	5 55	4 85
Sugar Loaf, Hobok. & Amb. "	5 15	....	4 95	4 95	5 55	4 85
Lehigh Coal Exchange "	5 15	....	4 95	4 95	5 55	4 85
Honey Brook Lehigh	5 15	....	4 95	4 95	5 55	4 85
Beaver Meadow at South Amboy	5 15	....	4 95	4 95	5 55	4 85
Schuylkill Coals at North 9th st., Brooklyn, E. D.†						
Schuylkill white ash	4 65	4 75	4 85	4 95	5 55	4 75
Schuylkill red ash	....	....	....	5 05	5 65	4 75
Shamokin white and red ash	....	....	....	5 10	5 65	4 75
Lorberry	....	....	5 75	5 75	5 75	4 80
Lykens Valley	....	....	6 20	6 20	6 20	5 25

* Contractor's prices are 20c. per ton less.

†The prices of Schuylkill coals for shipment from Philadelphia are 35c. per ton less than at Brooklyn.

‡ Boats towed by the D. & H. C. Co. at its expense to and from New York harbor.

Per ton.

Freight from Hoboken and Weehawken to New York .. 40c.
" " Elizabethport & Port Johnston to N. York. 40c
" " South Amboy to New York ..... 40c.

Freight by the boats of the companies from Hoboken, Port Johnston, Weehawken, Rondout, South Amboy and Perth Amboy to New York City and vicinity 50c.

Freight by the Pennsylvania Coal Company's boats from Newburg to New York 65c.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$6 00
" " at S. Amboy	5 50	6 00
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	..
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	4 25	5 75
Despard, West Va.	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	6 00
Fairmount, West Va., " "	4 35	6 00
Newburgh Orrel, Md. " "	4 50	6 00
Cannelton Cannel, W. Va.	....	10 00
" Splint, " at Richmond.	4 50	6 00
" Gas Coal at Richmond	4 00	....
" " " New York	5 50	....
Peytona Cannel, W. Va. at Richmond	8 50	10 00

Manufacturing and Steam Coals.

Cumberland, at Georgetown and Alexandria, Va	3 65@3 75	5 00
Cumberland, at Baltimore	3 90@4 00	5 25
Clearfield f.o.b. Canton, Baltimore	3 75@4 00	....

Rockhill Semi-Bituminous and Broad Top, at the mine, per 2,000 lb., 90, f. o. b. Greenwich, Philadelphia, per 2240 lb., $3 60@3 95, according to destination; at Amboy, 4 60; New York, 5 00.

Clearfield and Allegheny, "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, per 2000 lb., 90; at Greenwich, Phil., per 2240 lb., 3 75@4 25, according to destination; f.o.b. South Amboy, N. J., 4 75; New York, 5 25.

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/ Gold.	7 50
Block House, at Cow Bay, N. S	2 00	5 00
Caledonia, at Port Caledonia	1 50	4 75
Glace Bay, at Glace Bay	1 50	4 75
Lingan, at Lingan Bay	1 75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$5 70	$6 00	$5 30
Lackawanna coal, in yard	5 70	6 00	5 30
Wilkes-Barre, delivered	6 25	6 75	6 00
Lehigh & Locust Mountain, del'd	7 00	7 00	6 00
Schuylkill Red Ash, del'd	7 50	7 50	6 00

The Cost of delivery for Pittston and Lackawanna coal ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$18 00
Liverpool House Cannel " " "	†22 00
American " " "	13 00
Cannelton splint, " " "	9 00
Cannelton Block, " " "	9 00
American Orrel " " "	11@14
Red Bank Cannel " " "	14 00
Cumberland " " "	7 00

† This quotation is furnished to us by Messrs. WARD, TALBOT & OLYPHANT.

Baltimore, Md. May 25, 1876.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 62	$4 47
Broken	5 10	4 85
Egg	5 20	4 95
Stove	5 51	5 30
Nut	4 65	4 50
Shamokin, (red or white ash), and "Boston," free burning white ash,		
Egg	5 20	5 00
Stove	5 50	5 25
Lykens Valley, red ash,		
Egg and stove	6 05	5 68

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2240 lb. ..... $5 25@7 75

BITUMINOUS.

George's Creek, Cumberland f. o. b. at Locust Point. ..... 3 90@4 00
West Virginia Gas f. o. b. at Locust Point 4 50
Youghiogheny Gas, f. o. b. at Locust Point 4 50

Boston. May 20, 1876.

Coal is very dull. The retail dealers early in the week met and decided to open the season at $6.25 for broken, $6.50 for egg, and $7 for stove, all on wharf. Whether this will continue firm thoughout the early summer is much discussed, but there seem to be no reasons for breaking this compact, considering the very little money made the past two years in the retailing business, and the very small and peddling business likely to be done. In cargo lots no interest is taken beyond that of offerers to underbid one another. Receipts here continue small, both for the open market and on orders. Stocks on the wharf and in manufacturers' yards are light, but no disposition is manifest to load up in the slightest until the indications of a sharper revival of business generally are manifested. The receipt of 102 tons ex-ship Commerce, Glasgow, is a slight addition to the gas-house piles.

FREIGHTS are nowise improved. New York charters range from 85c. to $1, Philadelphia $1.35 and Baltimore and Georgetown $1.40@1.50. Charters from Caledonia to Boston have been made at $1.75, and 1 also Pictou to Portland, large ship, $1.75.—*Commercial Bulletin.*

Buffalo, N. Y. May 24, 1676.

Reported by our Special Correspondent.

The Scranton, Wilkesbarre, Plymouth, Shamokin, and Delaware and Hudson (Lackawanna) coals are offered for the present, subject to printed conditions, at the following prices per ton of 2,000 lb.:

Deliv'red at	Elmira	Ithaca.	Syracuse	Rochester.		Oswego
	Afloat	Afloat.	Afloat.	afloat	ret. del	f.o.b.
Grate	$4 00	$4 30	$4 45	$5 15	$6 00	$5 40
Egg	4 00	4 30	4 45	5 15	6 00	5 40
Stove	4 40	4 75	4 90	5 60	6 45	5 85
Nut	4 15	4 50	4 65	5 35	6 20	5 60

Delivered at	Erie.	Buffalo.		
	f.o.b.	Afloat.	f.o.b.	ret. del.
Grate	$5 90	$5 40	$5 90	$6 25
Egg	5 90	5 40	5 90	6 25
Stove	6 35	5 85	6 35	6 70
Nut	6 10	5 60	6 10	6 45

Cost of coal from Erie, Oswego, or Charlotte for Western market, same as if shipped from Buffalo. Terms cash. All payments to be made in New York City funds.

C. M. UNDERHILL, Gen. Salesman, Buffalo, N. Y.

Cincinnati, O. May 23, 1876.

Reported by our Special Correspondents.

The coal market has undergone very little change here for some time, and quotations are about the same, viz.:

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½@8c.	—
Pomeroy coal	5 @6c.	—
Kanawha "	7 c.	—
Cannel coal, according to quality	11 @16c.	—
The following are the retail prices delivered		—
Youghiogheny	10c.	—
Pomeroy	9c.	—
Cannel	14@22c.	—
Kanawha Semi-Cannel	10c.	—
Anthracite, per ton	10 50@11 00	
Coke, at yard	7c.	—
Coke, hard and soft, delivered	9@10c.	—

Chicago, Ill. May 23, 1876.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants. Retail prices per ton of 2000 lb. delivered to buyer.

Some changes have taken place in prices and we correct the list. It is as follows:

ANTHRACITE.		BITUMINOUS.	
Lehigh Lump	$9 50@10	Briar Hill and Erie	5 50@ 6 00
Lehigh grate and egg	9 50@10	Walnut Hill, Wa. V.	@ 5 50
Lehigh stove and chest.	10 00	Baltimore and Ohio	@ 5 50
Lackawanna, Wilkes Barre and Pittston*		Cannel	@ 8 00
Grate and egg	9 50	Blossburg	6 00
Stove and chestnut	10 00	Indiana Block	5 50
		Hocking Valley "Brooks"	5 5
		Wilmington and Illinois	4

Cleveland, O. May 24, 1876.

Specially reported by Messrs. BATES & MARTIN.

Per ton of 2000 lb. f. o. b. vessels.

WHOLESALE.

	For vessels,	On cars.
Youghiogheny Gas Coal	$4 10	$4 00
Cannel	4 25	4 15
Blossburgh	5 00	5 00
Briar Hill Block Coal	3 50	3 25
Straitsville Coal Co., lower vein	3 00	2 90
" " " whole "	2 90	2 80
Hocking Valley	2 90	2 90
Massillon	3 00	3 00
Tuscarawas Valley	2 65	2 60
Columbiana	2 65	2 60

RETAIL DELIVERED.

	Lump.	Nut.
Briar Hill	$4 50	$3 50
Massillon	4 50	4 00
Mineral Ridge	4 50	4 00
Columbiana	3 25	3 00
Straitsville Coal Co., lower vein,	4 00	3 50
Tuscarawas Valley	3 25	3 00

ANTHRACITE DELIVERED.

	Grate.	Egg	Stove.	Chestnut
Lehigh	$9 50	$9 50	$10 00	$9 75
Wilkes-Barre	8 00	8 00	8 50	8 25
Lackawanna	8 00	8 00	8 50	8 25

Erie, Pa. May 23, 1876.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. May 23, 1876.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers.

Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

White River, per ton	$2 50	Peytona cannel, per ton.	5 75
Brazil Block, "	2 50	Indiana Cannel	4 50
Highland, grate, "	2 25	Hocking Valley	4 25
Block coal, nut, per car.	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack "	17 00	Piedmont "	6 50
		Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$8 35	Nut	8 50
Egg	8 35	Stove	8 75

Lehigh Anthracite.

Broken	9 75	Nut	9 50
Egg	9 75	Stove	10 00

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	13	" Slack, "	7
Brazil Block	14	Peytona Cannel	28
Highland grate	13	Virginia "	27
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, " "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE.

Wilkes-Barre and Lackawanna (all sizes) ..... $9 75 per ton,
Lehigh, retail ..... $11 50 per ton.

Louisville, Ky. May 23, 1876.

Specially reported by Messrs. BYRNE & SPEED.

Our market is now, as during most of the Winter, very quiet.

Please report our prices as follows:

WHOLESALE.

	per bushel		per bushel
Pittsburgh	12c.	Pine Hill	—
Raymond City	9c.	Kentucky	8c.

RETAIL.

	per bushel		per bushel
Pittsburgh	12c.	Peytona Cannel	20@22c.
Raymond City	11c.	Buckeye "	20c.
Pine Hill	13c.	City-made Coke	10c
Kentucky	10c.	Anth., per ton, $10 00 to	10 50

Screened Pittsburgh per load $3 00
Screened Raymond City 2 75
Pine Hill (Kentucky) 2 75
Cannel ..... $5 to 5 50

Milwaukee, Wis. May 24, 1876.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 00
Lehigh Prepared	11 00	Blossburgh	8 00
Lackawanna (all sizes)	10 00	Cannel	8 00
Pittston	10 00	Pittsburgh	7 00
Scranton	10 00	Steam coal	00

New Orleans, La. May 23, 1876.

Reported by C. A. MILTENBERGER & Co.

Pittsburgh coal, retail, per bbl	30c.
" wholesale	5 c.
" steamboats, per box	50c.
" to manufacturers, per bbl	50c.
" shipments, per hhd	$6 00
Anthracite, wholesale, per ton	....
" retail, "	12 50
Virginia Cannel, per bbl	80c.
Scotch " "	80c.
Mt. Carbon, wholesale, per bbl	....
" " retail, "	55c.
St. Bernard wholesale, per bbl	....
" retail, "	50c.

Richmond, Va. May 20, 1876.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous,	$4 25
" semi-Cannel	4 75	Clover Hill Coal	4 00
Coalburgh Splint	4 60	James River Bitum	3 30
Lewiston "	4 60	" " Carbonite,	5 80
Kanawha Gas coal	4 50		

San Francisco, Cal.

From the *Commercial Herald*, May 18, 1876.

Imports from Jan. 1st to May 1st:

	tons.		tons.
Anthracite	6,724	English	8,973
Australian	15,719	Vancouver Island	32,144
Coos Bay	14,704	Rocky Mountain	98
Cumberland	2,044	Seattle	3,078
Mt. Diablo	33,832	Bellingham Bay	7,600

Spot prices of Australian continue to be well maintained; so also of Bellingham Bay, Coos Bay, Wellington, Seattle and Nanaimo. Scotch and English steam for forward delivery (next autumn), continue to be offered in cargo lots at $8, or less. The new steamer *George W. Elder*, from New York via Straits Magellan, has 1,073 cks. Cumberland coal on board, and to this may be attributed the recent break in the market for this description. Lehigh and other Anthracite is plentiful, and spot cargoes can be purchased at $12. Imports for the week under review embraces the following cargoes: The *Sonoma*, from British Columbia, has 1,800 tons of Wellington; *Shooting Star*, 1,000 tons Nanaimo; *Lookout*, 1,220 tons Bellingham Bay. From N. S. W., *Albuera*, 982 tons; *Cold Stream*, 945 tons; *Stella*, 750 tons. From Seattle, per *Harvest Home*, 985 tons; *Levi Stevens*, 820 tons same. From Coos Bay, 160 tons per *Loleta*, etc. We continue quotations of Australian at $10@10.25 ex-ship. Cumberland in casks held at $18@20; bulk, $16@18. Lehigh is plentiful and prices nominal. We quote Bellingham Bay at $8 50; Coos Bay, $10; California Mt. Diablo Steam, $6.25@8.25 for fine and coarse respectively; English and Scotch steam, $9@9.50; Nanaimo, $9.50@10; Seattle, $9.50@10; Anthracite, $12; Lehigh, $12@14; Wellington, $11@12, latter screened. The British ship *Respigadera*, from Newcastle, N. S. W., brings 2,200 tons.

Toledo, Ohio. May 23, 1876.

Specially reported by Messrs. GOSLINE & BARBOUR.

We quote coal as follows:

Per ton of 2000 lb. on cars.

Hocking Valley	$3 40	Massillon	3 60
Straitsville	3 40	Youghiogheny	5 00
Shawnee	3 40	Blossburg	6 50@7 00
" nut	2 90	Cumberland	6 50@7 00
Briar Hill	5 50	Connellsville coke	6 40

ANTHRACITE.

Grate, screened	$7 20	Stove, screened	$7 70
Egg, "	7 20	Chestnut "	7 45
Lehigh Lump	9 50		

40 cents to $1 per ton additional for delivery at retail.

Halifax, N. S. May 16, 1876.

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$4 00	Little Glace Bay	3 35
Gowrie	3 35	Blockhouse	3 35
Victoria	—	Albion (at Railroad)	4 00

Montreal. May 15, 1876.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per ton of 2240 lb.

Scotch Steam	$4 60	Cape Breton Steam	$4 00
Pictou "	4 50	Newcastle Smiths	5 50

Anthracite at retail, per 2000 lb., delivered.

Egg	$6 70	Chestnut	6 40
Stove	7 15		

Toronto, Ont. May 16, 1876.

Chestnut	$7 25
Stove	7 50
Egg and grate	7 25
Bituminous coal for domestic use	6 00
" " steam	3 50@5 50
Lehigh Lump and broken	7 50
Blossburgh	6 50

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals. per ton of 2240 lb	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J. (117 miles), via Central Railroad of New Jersey	2 32	2 18	2 74	2 63	2 86
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	47	70
‡ Philipsburg, N. J., (46 miles)	87	73	1 21	1 19	1 42
Elizabethp't, (114 m.) Pt. Johns., Hoboken & South Amboy, N. J., shipping and wharfage 35c. add.	1 96	1 82	2 29	2 27	2 50
High Bridge, N. J.	2 40	1 95	2 80	2 54	2 72
Elizabeth, Cranford, Westfield & Elizabethport, for consumption, Jersey City, N. J., (121 miles) and New York, via L. V. RR.	2 32	2 18	2 65	2 65	2 88
Andover, via Delaware, Lackawanna and Western RR.	3 30	3 10	3 70	3 69	3 99
Trenton Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	3 34
Trenton, (97 m.) for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

From *Mauch Chunk* to *New York* (121 miles), (towing limits) and Jersey City† via Lehigh Valley RR. $2 37

From *Mauch Chunk* to *Philadelphia* (93 m.) via L. V. and L. and S. RR. and North Penn. RR 1 75

††From *Phillipsburg, N. J.* to *Hoboken* (84 m.) for shipment via Delaware Lackawanna and Western RR., Morris and Essex Division 1 08

From *Lackawanna Junction* to **Auburn, N. Y.*, (191 m.) for shipment, via Southern Central R R. in connection with Pa. and N. Y. R.R. 2 41

From *Lackawanna Junction* to *Weedsport* (201 m.), for *Rochester and Charlotte* 2 47

From *Lackawanna Junction* to *Sterling* for *Oswego, N. Y.*.. 2 50

‖ To this point for all places between Rochester and Buffalo the rate is 2 53

* The rate to this point for Syracuse is 2 08

** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

† Transportation on Coal destined for re-shipment from this point is 20c. less than above rate.

†† The rate for consumption to this point is $1 80.

The distances in the above table are Computed from *Mauch Chunk*. From *Ashley* to *Mauch Chunk* the distance is 51 miles, and from *upper Lehigh*, 33 miles. From *Hazleton* 24 miles and from *Penn Haven* 8 miles.

From *Wilkes-Barre* to *Perth Amboy* via the Lehigh Valley Railroad Company, the distance is 161 miles, and from *Mauch Chunk* it amounts to 106 miles.

Freights.

Per ton of 2240 lb.

Ports.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	....	....	....
Albany	†80	....	....	....
Amesbury, Mass	....	....	....	....
Bangor, Me	....	1 50	....	1 00
Bath, Me	....	1 45	160–65	1 00
Baltimore	....	....	....	....
Boston, Mass	1 25@1 35	1 45@1 50	150–55	1 00
Bridgeport, Ct	*70	1 40	....	60
Bristol, R. I.	....	....	....	85
Cambridgeport, Mass.	§1 30@1 35	....	....	1 00
Derby	....	....	....	....
Dighton	....	....	....	....
East Cambridge	§1 30@1 35	....	....	§1 00
Fall River	1 25	1 40	....	85
Hackensack	*70	....	....	....
Hallowell, Me	....	....	....	....
Hartford	*70	....	....	....
Hoboken	†70	1 30	120–25	40
Hudson	....	1 30	1 40	....
Jersey City	....	1 30	1 25	40
Lynn, Mass	....	.. ..	....	†1 00
Middletown	....	....	....	1 00
Mystic	....	....	....	....
Newark	....	....	....	....
New Bedford	1 25	1 40	....	85
Newburyport	....	1 60	....	1 10
New Haven	*70	1 40	1 40	60
New London	1 25	1 40	....	75
Newport	1 25	....	....	85
New York	70†	1 25	1 30	40
Norwalk	70‡	1 40	....	60
Norwich	1 25‡	....	....	80
Pawtucket	1 25‡	....	....	....
Philadelphia	....	....	....	....
Portland	1 25	1 45	....	1 10
Portsmouth, N. H.	1 40	1 60	....	1 10
Providence	1 25	1 40	135–40	80
Poughkeepsie, N. Y.	....	....	....	....
Rockport	....	....	....	....
Saco	....	....	....	....
Sag Harbor	....	....	....	1 00
Salem, Mass	1 25@1 35	1 50	....	1 00
Salisbury Pt., Mass.	....	....	....	....
Stamford	*70	....	....	60
Stonington	....	....	....	80
Taunton	.. ..	.. ..	....	....
Troy	†80	....	....	....
Warren, R. I.	....	....	....	85
Wareham	....	....	....	....
Weymouth	....	....	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 30c. per bridge extra.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

From the Mines to Cumberland and State Line (say an average of 20 miles), the legal charge is 2 cents per ton of 2240 lb. per mile.

From State Line to Amboy (346 miles) $4 per ton of 2000 lb. On coal shipped beyond this point there is a drawback of 75 cents per net ton.

From Cumberland to Baltimore (178 miles) $2.02 per ton of 2240 lb., or $1.80 per net ton (½ cent per ton per mile for use of hoppers over C. & P. RR.).

From Cumberland to Georgetown (152 miles) by canal, $1.10. Tolls, 46 cents.

From the Mines to Piedmont, 4 cents per ton of 2240 lb. per mile on distances less than 4 miles, and 3 cents per ton per mile on distances over 4 miles, and 2 cents per ton per mile on distances over 10 miles.

From Piedmont to Baltimore (206 miles) $2.34 per ton of 2240 lb., or $2.08 per net ton.

From Osceola to Greenwich, Phila. (say 248 miles) per T. & C. RR., per ton bituminous coal of 2000 lb., less drawback of $1.46 $2.15; rate per gross ton, $2.60.

From Osceola to South Amboy, N.J., (317 miles) per 2000 lb., $4.03, less drawback, $1.03; rate per net ton, $3; add 12 per cent. for gross ton, 36 cents, terminal expenses, shipping, 20 cents; rate per gross ton, $3.56.

Towing.

Rates of Towing from New York to places on the *Hudson River*. Boats of 175 tons capacity and upwards.

Per ton of 2240 lb.

	cts.		cts.
Yonkers	9	West Point & Cold Spring	17
Piermont & Dobbs' Ferry	12	Poughkeepsie	20
Nyack & Sing Sing	15	Rondout	23
Peekskill & Haverstraw	16	Hudson	25

Rates for boats of 100 tons, per boat, are as follows:

	cts.		cts.
Manhattanville	10	Sing Sing & Peekskill	20
Yonkers	15	Newburg	25
Tarrytown	18	Poughkeepsie	30

Special Rates will be made for Saugerties and Catskill.

East River, from the foot of Twenty-third street, to the following points, *and return*, per ton:

	cts.		cts.
New Haven & Norwalk	33	Middletown	65
Southport and Milford	35	Norwich	67
Branford	45	Hartford and Mystic	75
New London	60	Stonington	75

Derby 33 cts. per ton and $50 per boat extra.

Bristol, Fall River, Providence, New Bedford, *Special rates.*
Boats having less than 200 tons, will be charged the same as if carrying that quantity.
* Rates of Towing from foot of 23d Street, E.R., to the following points.

Boats upwards of 150 tons capacity.

79th street 93d st. and Astoria, and return*.....$12	New Rochelle and Glen Cove.....$50
Mott Haven and Harlem†.. 16	Mamaroneck and Portchester 60
Flushing and Whitestone‡ 25	Greenwich and Darien ... 70
Little Neck and Port Washington 40	Round trip to Port Johnston 14
College Point and Bowery Bay 25	Round trip to Elizabethport 16
Roslyn 50	

From Hoboken to Limits (53d Street.) E. R., $5; N. R., $6
Other Towing in the vicinity of New York, special rates:
* Small boats (less than 150 tons) to these points..... .. $10
† " " " " " " " " 14
‡ " " " " " " " " 20
Rates via the Hudson River are furnished to us by A. B. VALENTINE, No. 41 Jay Street. Rates via the East River are furnished by W. E. GLADWISH, No. 12 South Street.
*These rates are furnished to us by DAVID COX, 89 West St.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, May 26, 1876.

American Pig.—We note sales aggregating 3,000 tons of forge on private terms, and 2,000 tons of Nos. 1 2 foundry irons at $22@$20 respectively. The business for a few weeks back has been very much better than earlier in the year, but it appears to be settling down to quietness again. The attempt to advance prices to the basis of $23 has been a failure so far as doing business at that figure is concerned. The iron sold during the past month was in large blocks, and the business does not indicate an improved demand from general consumers. It is probably business similar to that done at an earlier date in 1875, and has been deferred this year in anticipation of lower prices. We quote No. 1 foundry at $22@$23; No. 2, $20@$21, and forge at $18@19.

Scotch Pig.—The importations continue to be taken about as soon as they arrive—none having gone into store yet—but prices, although nominally the same, are not so strong. We quote Eglinton at $28@$28.50; Coltness, $30@$31; and Glengarnock, $29.50@$30.

MESSRS. JNO. E. SWAN & BROTHERS, LIMITED, of Glasgow, under date of May 12, report 110 furnaces in blast as against 122 a year previous; 63,254 tons of pig iron (an increase of 200 tons over a week previous) in CONNAL & Co's stores, as against 31,432 tons at the corresponding date in 1875; shipments for the week ending May 6, 12,570 tons, as against 11,624 tons for the corresponding week of 1875; total shipments since December 25, 152,692 tons as against 187,664 tons for the like period of 1874-5; quotations of No. 1 pig iron: Gartsherrie, 65/; Coltness, 67/; Summerlee, 62/ 6d.; Langloan, 66/; Glengarnock, 63/6d.; and Eglinton, 57/; freights: to New York 16/; Boston 9/; New Orleans, 5/; Baltimore, 8/; Philadelphia, 10/; and San Francisco, 27/6d.

Rails.—We are reported sales of 2,500 tons of rails at New Orleans, and lots aggregating 10,500 tons for Western and South-Western delivery. There are numerous inquiries in the market, and the feeling is much better. We continue to quote at $39@$43 at mills for iron rails, and $58@$61 for steel.

Old Rails.—We are reported a sale of 150 tons at a price equivalent to $20.50 here, and 2,000 tons old T at $22.25 at Portland. In addition to this there are rumors of another sale, the particulars of which we did not learn. We quote at $22@$23.

Scrap.—We are reported a sale of 200 tons at a price equivalent to $28 here.

Philadelphia Iron Trade.

Weekly report of the Philadelphia Iron Market, furnished by Messrs. JUSTICE, COX, JR., & Co., Iron Merchants, 333 Walnut street, Philadelphia. Week ending May 25, 1876.

The iron business remains as it has been for some months; sales of small lots at exceedingly low prices. The advance so long looked for does not come, whilst prices go no lower. Consumers seem satisfied with present prices, buying only as they want, concession in price having no effect. We quote No. 1, $22.50 to $23; No. 2, $20.50 to $21; Gray forge, $20 to $20.50. Report sales of 500 Chickies private terms; 100 St. Charles; 200 Montgomery, all at quotations.

BAR IRON is in somewhat better demand, but still at the very low prices. We quote $2.35. Report sales of 350 tons Catasaqua at quotation.

RAILS.—New iron rails are in some demand for light section. We have one sale of 100 tons at $44. We quote $40 to $45, as to weight and delivery.

OLD RAILS are in demand at a small advance. Report sales of 500 tons at $23.75. We quote $23 to $25, as to weight and delivery.

SCRAP is dull of sales at $15 to $18 for cast, and $25 to $30 for wrought.

Baltimore. May 25, 1876.

Specially reported by Messrs. R. C. HOFFMAN & Co.

The iron market continues dull, with light sales at quotations.

Ballimore Charcoal....$30@35	Anthracite No. 3... $20@21 00
Virginia Charcoal..... 28@34	Mottled and White..17@19 00
Anthracite No. 1..... 23@24	CharcoalC.B.Blooms 65@67 50
" No. 2..... 21@22	Refined Blooms.....50@55

Boston. May 20, 1876

PIG is very dull, with holders again hammering the market for bids and pitting their prices against one another in a most discouraging way. On the most popular brands of No. 1, and No. 1x as low as $21.50 and $22 f. o. b. a point of shipment has been put out as an inducement for orders, with a $1.15 to $1.25 freight.

BAR has hsd a small and quiet jobbing trade wholly, with prices, on some of the extras especially, higher. The market holds its improved tone rather encouragingly, quoting blacksmiths' orders 2 3-10@2½, and large machine orders $50@$52.50 a ton. This is a difference that is indicative of the improvement in the market, and shows a range covering cash-down and long-winded patrons

OLD IRON is in light supply, and, excepting for light wrought, not sought by buyers. On No. 1, Norway reduced its paying price to $1.25 delivered in the yard, equal to about $1.18@$1.20 out of store; while the Weymouth are understood to have gone down to $1.20 on cars at the Old Colony road. The Tremont and the Chelmsford have selected six to ten cars at $1.35 f. o. b. but the style as well as the price was exceptional. Light wrought, such as hoops, shovel and hoe blades, etc.. are wanted at 1c. f. o. b Something decidedly clean and uniform in a lot of ten to thirty tons could realize at the depot here a fraction higher, though one of the Cape buyers took in a good round lot this week at 80c. Several full lots of stove plate have been sold this week to foundries at 60c. put on team, but there are holders who refuse to take less than 62c. cash for their piles as they stand in the store, and yet others who ask 70c. f. o. b, Machinery is decidedly dead, no one seeming to want it at any price. Cullet and rubber are dull and nominal.—*Commercial Bulletin.*

Chattanooga, Tenn. May 23, 1876.

Specially reported by J. F. JAMES pig iron broker, etc, 233 Market Street.

The market here is as brisk as can be expected these dull times. Considerable iron is moving West and South for present requirements. I have to note some fair sales in lots from 50 to 250 tons at market prices, which remain the same as last reported.

The usual four months' time on quotations below is allowed.

Tenn. Ala. and Ga. Charcoal, No. 1 foundry.....$21@ 22	
" " " " No. 2 foundry..... 20@ 21	
" " " " gray forge..... 17@ 18	
" and Georgia coke, No. 1 foundry..... 18@ 19	
" " " " No. 2 foundry..... 17@ 18	
" " " " gray forge..... 15@ 16	
White and Mottled..... 14@ —	
Tennessee and Georgia cold-blast car wheel..... 24@ 25	
Alabama " " ..... 24@ 25	
Old Rails.....cash 22 00	
Cast Scrap ..... " 12	
Wrought Scrap..... " 16	

Chicago. May 16, 1876.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron.

The following are the present quotation for pig metal in our market:

No. 1 Coltness.....$38 00@	
No. 1 Gartsherrie..... 38 00@	
No. 1 Summerlee..... 37 00@	
No. 1 Glengarnock..... 36 00@	
No. 1 Eglinton..... 35 00@ ..	
Warner's "American Scotch" ..... 30 00@	
Massilon No. 1 Foundry ..... 29 00@	
No. 1 Grand Tower Mo. ores (Bituminous) ..... 20 00@	
No. 2, " " " ..... 28 00@	
No. 1 Mill.. ..... 25 00@ ...	
No. 1 Foundry, Ohio..... 28 00@	
No. 2 " " ..... 27 00@	
No. 1 Hanging Rock (charcoal)..... 28 00@	
No. 2 " " " ..... 26 00@	
Union "A" 1 (Anthracite)..... 28 00@	
Union "B" 1 (Anthracite)..... 26 00@	
No. 1 Lake Superior (charcoal)..... 28 00@	
No. 2 Lake Superior " ..... 26 00@	
No. 3 Lake Superior " ..... 26 00@	
No. 4 Lake Superior " ..... 28 00@	
Bessemer Steel Rails..... 65 00@	
New Iron Rails..... 45 00@ ..	
Old Rails..... 28 00@ ...	

Cincinnati. May 23, 1876.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

The pig iron market remains in the same state as last reported. We quote:

CHARCOAL.

Hanging Rock, No. 1 Foundry.....$25 00@ ....—4 mos	
" No 2, " ..... 23 00@ ....—4 mos	
" Mill ..... 21 00@22 00—4 mos	
Tennessee, No. 1, Foundry..... 23 00@24 00—4 mos	
Tennessee, No. 2, " ..... 22 00@23 00—4 mos	
" Mill..... 21 00@22 00—4 mos	
Missouri, No. 1, Foundry..... @ ....—4 mos	

STONE COAL.

Ohio, No. 1, Foundry..... 23 00@ ....—4 mos	
" No. 2, " ..... 22 00@ ....—4 mos	
Ohio Mill ..... 21 00@ ....—4 mos	
Missouri, No. 1 Foundry ..... 27 00@ ....—4 mos	
" No. 2, " ..... 26 00@ ....—4 mos	
" Mill..... 24 00@ ....—4 mos	

CAR-WHEEL.

Hanging Rock, C. B..... 40 00@45 00—4 mos	
Tennessee " ..... 30 00@33 00—4 mos	
Missouri " ..... 32 00@35 00—4 mos	
Alabama " ..... 30 00@33 00—4 mos	

BLOOMS.

Charcoal..... 60 00@ 75 00—cash	

SCRAP IRON.

Cast..... 50c.@ 80—cash	
Wrought..... 1 00@1 35—cash	

Cleveland, Ohio. May 23, 1876.

Messrs. C. E. BINGHAM & Co., quote as follows:
Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, Lake Superior Charcoal ..... 27 00@....	
No. 2, " " " ..... 26 00@....	
No. 1, Anthracite..... 25 00@....	
No 2, " ..... 23 00@....	
No. 1, Bituminous ..... 25 00@ ...	
No. 2, " ..... 23 00@....	
American Scotch, No. 1, Cherry Valley..... ... 27 00@....	
" " B—1, " " ..... 26 00@....	
" " No. 2, " " ..... 24 00@....	
No. 1, Massillon..... 27 00@....	
B—1, " ..... 25 00@....	
No. 2, " ..... 23 00@ ...	

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal ..... 26 00@....	
No. 4 " " " ..... 27 00@....	
Nos. 5 and 6 " ..... 28 00@....	

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal ..... 27 00@....	

FORGE IRON.

No. 1, Gray..... 22 00@....	
White and Mottled..... 21 00@....	

Louisville. May 23, 1876.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is dull, the demand being confined to small lots for immediate use. Stocks on hand are light.

The usual time, four mos., is allowed on the quotations below:

HOT BLAST—CHARCOAL.

No. 1 Foundry, from Hanging Rock Ores.....$24 00@26 00	
No. 2 " " " ..... 22 00@23 00	
No. 1, Mill, from " " ..... 20 00@21 00	
No. 1, Foundry, from Alabama, Georgia and Tennessee ores ..... 22 00@23 00	
No. 2, Foundry, from Ala., Geor'a and Tenn. ores 21 00@22 00	
No. 1, Mill, from " " " " 20 00@21 00	

HOT BLAST—STONE COAL AND COKE.

No. 1, Foundry, from Hanging Rock Ores..... 23 00@24 00	
No. 2, " " " " ..... 21 00@22 00	
No. 1, Mill, " " " " ..... 20 00@21 00	
No. 1, Foundry, from Ala. Ga. and Tenn. Ores. 22 00@23 00	
No. 2, " " " " ..... 20 00@21 00	
No. 1, Mill, " " " " ..... 19 00@20 00	
No. 1 Foundry, from Missouri Ores..... —— @ ——	
No. 2 " " " " ..... —— @ ——	
No. 1 Mill, from Missouri Oies ..... 24 00@25 00	

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock Ores..... 35 00@40 00	
" " Tennessee " ..... 28 00@30 00	
" " Alabama and Georgia Ores..... 28 00@38 00	
" " Kentucky Ores ..... 28 00@38 00	

Pittsburgh, Pa. May 23, 1876.

Specially reported by A. H. CHILDS, Esq.

Market is quiet and unchanged. While some buyers are ready enough to take up any good lots offered at a concession, they will not purchase in excess of immediate wants, at regular market price.

No 1. foundry.....$23 50@25 00—4 mos	
" 2, " ..... 22 00@23 00—4 mos	
Gray forge ..... 21 00@22 50—4 mos	
White and mottled..... 18 00@20 00—4 mos	
Warm blast charcoal ..... 22 00@25 00—4 mos	
Cold blast " Western..... 40 00@45 00—4 mos	

St. Louis. May 23, 1876.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

Our market remains the same as last reported. Every thing is extremely dull, and but little encouragement for the future.

San Francisco, Cal.

From the *Commercial Herald*, May 18, 1876.

The very free arrivals of Scotch, English, and American pig iron, with large stocks in warehouse, is the occasion of lessened prices being offered for invoice parcels, with few transactions to report. Sydney pig tin has recently been sold at 19¼c. There is rather more tone to the market for bar and other manufactured iron, but without notable change in values. The general jobbing trade in this department of goods is fair for the season, though not up to the full average of the past. Tin plates is very plentiful, and selling at low prices.

Montreal. May 16, 1876.

We continue to quote: Pig iron Eglinton and Clyde $21@21.50; Carnbroe $21.50@22; American $22@24; Summerlie and Calder $22@23; Langloan and Gartsherrie $22@23; Coltness $22.50@23.50; Hematite $30@31. Bar, per 100 lb., Scotch and Staffordshire, $2.20@2.25; best do., $2.50@2.60. Swedes and Norway $5@5.50; Low Moor and Bowling, $6.50@7—*Monetary Times.*

METALS.

NEW YORK, FRIDAY EVENING, May 26, 1876.

The business done during the week has been very limited, only one article having attracted particular attention. Purchases continue to be confined almost entirely to the immediate wants of buyers. The outlook is not encouraging.

MR. ERNEST W. S. MURRANT, of London, under date or May 12, says: "There appears at the moment no prospect of any immediate improven ent in our market; and the last Board of Trade returns leave much to be desired; meanwhile prices have been very fairly sustained, so far."

Gold Coin.—During the week under review, gold coin has ranged from 112¼ to 112⅞ and closed at 112⅝.

Bullion.—Information, by cable, from London, today, quotes that market "weak and nominal" at 52d.

This is a decline of 3/8d. since our last. This market has declined to 113 per oz., while San Francisco quotes at 13 per cent. discount. "Fine gold bars are unchanged in price, and quoted as follows: New York, par ($20.67, gold, per oz.,) to ¼ per cent. premium; San Francisco, par; and in London, 84/ 7½d."

Copper.—There is no change in the demand for this article. The sales during the week under review, like those of the previous week, are hardly worthy of notice. There is but very little copper offering, but, as the wants are even less, the price has been steadily weakening, until now the quotations are 21@21¼c. As we remarked in our last, unless some unexpected demand should spring up, we are likely, after the arrival of new copper, to see a further weakening until the prices become so low that foreigners can come in and take our surplus, when a rebound will take place.

Mr. MURRANT says of copper: "At the Swansea Ticketing of ore on the 9th inst., about 255 tons in fine with an average produce of 19 5-16th's per cent. brought an average price of 15/8d. per unit. The London market for foreign has become flat during the last day or two, and sales at nominal rates have been rather difficult to effect. The closing price of bars was £79 cash sellers, forward lots being procurable at same figure."

Tin.—Pig tin has been rather quiet, although prices show no particular change. Straits, according to cable information, is quoted in London to-day at £76, firm. In large lots, in this market, the price is 18¼c. gold, and in small lots, 18½c.; L. o. F. in large lots, 17¾c., and small, 18⅛c. Refined nominal at 18c., and Banca, 22c.

Mr. MURRANT says of tin: "In foreign a slight spurt was shown on Tuesday and Wednesday, the nominal price being at one time about 75/, but at the close last night there were sellers at 75/6d., with buyers at 73/2d. for small quantities, the tendency being rather downward than otherwise. It is difficult to account for this sudden recovery and relapse, but the impression appears to be that at the next sale of Banca on the 31st inst. the Trading Company will reduce their limit of 50fl., in order to accelerate the sale of the 900 tons which will then be offered."

Tin Plates are in very light demand, although unchanged in prices, which are as follows, in gold, per box: charcoal tins, $7@$7.25, and ternes, $6.50@$7; coke tins, $6@$6.25, and ternes, $5.62½@$6.

Messrs. ROBERT CROOKS & Co., of Liverpool, under date of May 11, say in relation to tin plates: "Purchases are still only being made from hand to mouth to satisfy actual wants, the low prices taken having created no speculative demand. Desirable second-hand lots are necessarily somewhat disappearing, but enough remain to force down makers' prices."

Lead.—This article has attracted most attention during the week under review. The sales include 900 tons of "Richmond," which includes all in transit and all that will be shipped for several months; 1,000 tons of Western for delivery until October, and some 800 tons of refined corroding lead, being all that is offered at present and for some time to come. The prices realized ranged from 6·15c., gold, to 7c., currency, for ordinary, and 7·30c.@7·40c., currency, for refined, the purchases being chiefly for consumption, although dealers took a portion. Supplies so far this year show a falling off as compared with last year, and buyers, fearing that this decrease would not be made up and that prices might even advance, came into the market in a body. It is a very difficult matter to make a satisfactory estimate of the prospective production for the balance of the year, but from such reports as we have we are inclined to think that the production for 1876 will be fully as great as that of 1875. The market closes nominally at 6½c., currency, there being no orders to test it.

Antimony is quiet at 15½c. gold.

Quicksilver is without change and quoted as follows: In San Francisco, 55c.; New York, 60c. gold, per lb., and in London, £10 per flask.

Spelter and Zinc.—Domestic spelter is very quiet at 7¾c. currency, for outside lots. Sheet zinc remains at 8⅛c.@8¾c. gold.

The San Francisco *Commercial Herald*, of May 18, says of quicksilver: "Exports to Hongkong, per steamers *Belgic* and *Lord of the Isles*, will, no doubt, aggregate 1,500 flasks or more The price paid is 55c. The market at the close is weak at this rate, and by reason of very free receipts and a lessened export, prices will no doubt soon drop to 50c., and at this some monthly contracts could now be made for forward delivery."

FINANCIAL.

New York Stocks.

FRIDAY EVENING, May 26, 1876.

The coal stocks still continue their downward movement, the decline ranging through the whole list. Sales for the week have been very large, amounting to over 55,000 shares. Undoubtedly a large proportion of these shares are thrown on the market by timid holders who desire to realize. But it has also been rumored that many of the sales were in the interest of officers of the companies, and such capitalists as MOSES TAYLOR, who are well acquainted with the "bottom facts." The decline is easily accounted for by the present condition and future prospects of the coal trade, and it is by no means certain that they have yet touched bottom.

Delaware, Lackawanna and Western Railroad.—This stock is 1⅞ below the closing quotation in our issue of the 20th inst.; the sales for the week amount to nearly 28,000 shares. Sales have been made as low as 101¼, but a decided recovery from that figure was made, the stock closing at 104. It is expected that the company will pay a dividend in July—if not out of current earnings, then out of the surplus, which is still large. It may be doubted, however, whether the dividend will be at the old rate of 10 per cent. Indeed, it is pretty safe to say that it will not be. What the earnings thus far in the present year are, no one outside the company is allowed to know. Narrow gauge trains are running on the road from Syracuse to New York. The narrow gauge track is used exclusively in the transportation of coal, while the passenger trains continue to travel over the broad gauge. A coal train a day is also sent over the latter. The complete change from broad to narrow will be effected on the 29th of this month.

The New Jersey Court of Errors and Appeals has decided against the Delaware, Lackawanna and Western Company in their appeal against the condemnation of the land appropriated by the Hudson River Tunnel Company.

Captain GLENNY, of the Third Precinct, Jersey City, who has been engaged in making an investigation of the damage done by the explosion of rend-rock powder at the Delaware, Lackawanna and Western Railroad Tunnel, about two weeks ago, has made an official report to the Chief of Police. The total number of buildings damaged on the Heights is 552, and the estimated loss amounts to $99,045. The buildings injured were within a radius of half-a-mile. The damage done in Hoboken has not yet been ascertained. A large number of suits has already been begun against the railway company.

New Jersey Central Railroad.—This stock has been very freely dealt in during the week, the sales aggregating 23,758 shares. The fluctuations have amounted to nearly 10 per cent. between the extreme limits, the stock having sold down as low as 79¾, but recovered to 81⅛, at which it closed.

Delaware and Hudson Canal Company.—The dealings in this stock for the week represents the unusually large total of nearly 2,200 shares, with fluctuations of nearly 8 per cent. between the extreme limits. The stock has sold as low as 103, but recovered to 105½, at which it closed, a decline of 4½ from our last.

Mariposa Land and Mining Company.—This stock is lower and almost wholly neglected. An assessment of $1 per share has been levied by the company, delinquent June 3d. The tunnel is nearly sixteen hundred feet long, and its various branches and crosscuts over one thousand feet. A clean-up of the stamp batteries yielded a considerable amount of gold amalgam. The expenses of the estate for the month of April, as reported to the New York Stock Exchange, amounted to $13,775 for machinery, labor and supplies, and the receipts from rents were $661.

The mills have been completed, and turned over to the Superintendent. They will at first be run on gold ores from outside mines.

Union Mining Co. of Tennessee.—Nearly 9,000 shares of this stock has sold during the week at from 1¾ to 1¾. The annual meeting of this company will occur on the 22d of June.

Consolidation Coal Co.—This stock is unchanged, and almost neglected.

The Spring Mountain Coal Co. announces a semi-annual dividend of 40 per cent., payable on the 10th of June. This stock closed at 64⅛ bid.

Bonds.—No material change is noticeable in these. Sales amount to nearly $90,000.

Erie.—The work of laying the third rail between Elmira and Buffalo is completed, and the first standard-gauge train ran through from Waverley to Buffalo May 22. The train was a special from the Lehigh Valley road, and the occasion was celebrated by a dinner at Buffalo.

There is talk of extending the third rail from Waverley east to Binghamton, 41 miles, to complete a connection with the Albany & Susquehanna.

Auction Sale of Mining Securities.—The following stocks and bonds are advertised to be sold at the Exchange Salesroom, 111 Broadway, on Wednesday the 31st inst, per order of the Assignee of the estate of DUNCAN, SHERMAN & Co.:

44 shares Trevorton Coal Company, par $100.
1,211 shares Lower California Company, par $100.
2,800 shares New Burra Copper Mining Company, par $5.
750 shares Providential Silver Mining Company, par $20.
$15,000 Certificates of Indebtedness of Providential Silver Mining Company.
100 shares Cumberland Coal and Iron Company, par $100.
6,722 shares Fountain Oil Company, par $10.
1,212 shares North American Petroleum Company, par $10.
600 shares Collins Iron Company, par $25.
1,000 shares Lake Superior Silver Lead Company, par $5.
500 shares Champlain Ore and Furnace Company, par $100.
4,160 shares Empire Gold and Silver Mining Company, par $100.
150 shares La Esperanza Mining Company, par $500.
$500 Commonwealth Silver Mining Company Bonds, with Coupons from March, 1867.
$10,000 Collins Iron Company 1st Mortgage Bonds, with Coupons from March, 1871.
$4 000 Trevorton Coal Company Bonds, with Coupons from July 1, 1864.
$40,000 Empire Gold and Silver Mining Company 1st Mortgage Bonds with Coupons from November 1, 1866.
1,000 shares Union Copper Company of Lake Superior, par $25.

Quotations and Sales of Stocks and Bonds.

For the week ending May 26, 1876.

STOCKS.

	Highest	Lowest	Closing.	Shares sold.
Pennsylvania Coal Co	—	—	*270	—
Consolidation Coal Co	—	—	40	160
Spring Mt. Coal Co	—	—	†64½	—
American Coal Co	—	—	*46	—
Maryland Coal Co	—	—	13⅜	—
Del., Lack., and West. RR. Co.	105⅞	101½	104	27934
New Jersey Central RR. Co.	88	79¾	81½	23758
Delaware and Hudson Canal Co.	110¼	103	105½	2195
Quicksilver Mining Co. pref'd	—	—	21	—
" " " Common	15	14¾	14¾	1000
Mariposa Land & Min. Co. pref'd	—	—	5	100
St. Louis & Iron Mountain RR.	—	—	17½	
Lehigh & Wilkes-Barre Coal Co.	—	—	*40	—
Total Shares sold				55147
Sales for the week previous				39124
Increase				16023

* Nominal. † Asked.

BONDS.

	Sales.	Price
Ches. & O. R. R. 6s, 1st. cou. on	10,000	— @ 28
" " " ex coupon	—	— @ 26
Central RR. of N. J. 1st Mtg. N.	6,000	111½@111¾
" " " 1st Cons.	13,000	105⅛@106
" " " Convt.	10,000	101 @102½
Del. and H. Canal, 1st Mtg. 91'	—	— @111
" " 78, '84	5,000	108½@109
" " Reg. '94	5,000	— @108
Del., Lack. & W. R. R., 78, conv.	—	— @ —
" " " " 2d Mtg.	9,000	— @108½
St. Louis & Iron Mount'n 1st Mtg	1,000	— @102
St. Louis & Iron M'tn, 2d Mtg.	13,000	— @ 78
Lehigh & Wilkes-Barre Cons.	17,000	91 @ 92
Total Sales	$89,000	

Closing quotations, in the absence of sales, represent the latest prices bid.

Philadelphia Stocks.

PHILADELPHIA, May 26, 1876.

With but one exception, the Philadelphia stock list as quoted by us is lower. The sales amount to some 70,000 shares. The general course of the market during the week has been to steadily declining figures.

Pennsylvania RR.—This stock is unchanged, the sales aggregating 48,000 shares. During last year this company laid down 6,895 tons of steel rails upon its main line, and the Harrisburg and Lancaster and other branches. A further quantity of 4,372 tons of steel rails was laid on the New Jersey lines, while before the close of 1876, the double track of the New York division will be laid with steel, a similar improvement being contemplated on the Amboy and Belvidere-Delaware divisions as renewals are required. The Philadelphia and Erie also received steel rail renewals last year to the extent of 4,173 tons.

Lehigh Valley RR. stock shows a material decline. The sales for the week have amounted to 1,872 shares, the stock closing at 55½, a decline of 2¼ from the closing price in our issue of the 20th inst.

Philadelphia and Reading RR.—This stock is very steady. Sales for the week have amounted to 10,747 shares. Prices closed at a decline of ½ from our last.

Lehigh Coal and Navigation Company's stock has been quite active during the week, the sales footing up nearly 10,000 shares This company has declared a dividend of $1 per share payable June 3d. Closing quotations of this stock show a decline of ¼ ex-dividend.

Pennsylvania Steel Company.—11 shares of this stock sold at auction during the week at $68 per share.

Sellers Manufacturing Company.—4 shares of this stock sold at auction during the week at $1 per share.

Quotations and Sales of Stocks and Bonds.

For the week ending May 25, 1876.

STOCKS.

	Highest	Lowest	Closing	Shr's
Lehigh Valley RR. Co.	58	55	55½	1872
Pennsylvania RR.	53⅛	51⅞	52⅝	48017
Reading RR.	44¼	43¾	44	10749
Lehigh Coal and Nav. Co	45¼	43½	†43½	9665
Penn. Canal	—	—	*9	—
Buck Mountain Coal Co.	—	—	25	—
Fulton Coal Co.	—	—	*3½	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co.	—	—	79½	—
St. Nicholas Coal Co.	—	—	*1	—
Cambria Iron Co.	—	—	15⅛	200
Crane Iron Co.	—	—	25	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co.	—	—	68¼	30
Total shares sold				70,531
Sales for the week previous				71,876
Decrease				1,345

* These quotations are nominal. † Ex Dividend.

BONDS.

	Sales.	Price
H. and B. T. RR. 1st mortgage, 7s	—	— @107
" " " 2d "	—	— @104
" " " 3d " cons	—	— @ 50
Lehigh Valley RR. Con. mtg. 6s, Reg.	3,000	— @101½
" " " 7s, 1910	5,000	— @110
" " " 6s Reg.	—	— @107

Pennsylvania RR., 1st mtge. 6s	3,000	——	@106¾
" " gen. " con. 1910	——	——	@ —
" " gen. " 6s, reg	——	——	@ —
" " Cons. M. 6s reg	——	——	@ —
Phil. & Reading RR. 7s '93	——	——	@107
" " G. M. 7s, reg.	3,000	——	@105½
" " " Deb. 7s	——	——	@ 82†
" " new convertible 7s.	25,200	——	@100
" " mtg. 6s '43-'80	2,000	——	@104
Phil. & Reading C. & I. Co. Deb. 7s	1,000	——	@ 78¾
" " Swatara tract	——	——	@ —
Lehigh Coal & Nav. Co., 6s '84	——	——	@102¾
" " " RR. 6s, '97	2,200	103	@103¼
" " " gen m. 7s Reg	——	——	@105
" " Convt. gold, '97	14,500	103⅛	@104
Penn. Canal, 6s	——	——	@ 75½
Penn. and N. Y. Canal, 7s	——	——	@109⅝
Ches. and Del. Canal, 6s	——	——	@ 86½
Susquehanna Canal, 6s	——	——	@ 73¼
Delaware Division Canal, 6s	——	——	@ 99¾
Susquehanna Coal Co. 6s	——	——	@ 80
Buck. Mount Coal Co. 6s	——	——	@ 97½
Penn. Gas Coal Co. 6s	——	——	@100¼
Honeybrook Coal Co. 7s	——	——	@ 90
Total amount of sales	$58,900		

Closing quotations, in the absence of sales, represent the latest prices bid.

† Asked.

Gold and Silver Stocks.

NEW YORK, FRIDAY EVENING May 26, 1876.

In San Francisco the majority of quotations of mining shares are lower, and a very quiet market is reported this is accounted for by the absence of many of the principal operators from the board, rather than in a decline of the irrepressible desire of the average Californian to speculate.

New Amalgamating Processes.—We note the recent invention of two new systems for the reduction of ores, both claiming advantages over all others which have gone before, one of these is said to have been invented by a Mr. PAUL, a Californian. His process, he asserts, will produce from 10 to 100 per cent. more metal than any known system of amalgamation operated at the same expense. A party by the name of HARRISON, located at Santa Rosa, California, has quite another method, by which he claims to be able to make from ores containing the base metals bullion 950 fine. The entire cost of the machinery necessary for a twelve stamp mill, inclusive of chemicals, is placed at $1,500.

It is not doubted that these gentlemen will find followers ready to endorse their claims to having at last discovered the secret for converting base metals into gold and silver, for that must necessarily be the meaning of a claim to get 100 per cent. more metal out of an ore, than is now obtained by the common processes which yield from 65 to 85 per cent. of all the ore contains—the alchemists are not all dead yet, as some suppose.

California.—This stock exhibits a slight advance compared with our last. It is reported that the development on the 1,500 level look well, and that No. 6 winze on the 1,600 levels continues in very high grade ore. The C. & C. shaft has reached the 1,500 level. The progress of sinking this shaft has been interrupted by water, and we shall not probably see the full development of work in these mines, before the heavy pumping machinery now being constructed gets into operation. For the week ending May 13th, the ore extracted amounted to 2,520 tons, which is being crushed by the California and Sacramento mills. Bullion receipts on May account $356,373.

The California Mill Company will soon begin the erection of a $250,000 tailings mill on the site of the old Gould & Curry mill. The old walls of the latter, which are still standing in a good state of preservation, will be used for the new structure. In order to provide the mill with working material, the tailings and slimes of the California Company's ore mills will run down the Seven-mile Cañon in a flume, which will have two compartments—one for slimes, the other for tailings. The slimes will be collected in three sets of three reservoirs—nine in all; and the tailings will be run over three sets of sluices, and allowed to find their way down the Cañon. This is a very important improvement. The works which it is proposed to erect, will give employment to quite a number of men, and infuse new spirit into the old residents of Six and Seven-mile Cañons, who, in hopes of better times, have clung by their homes since 1865 and 1867.

Consolidated Virginia is steady, at the rates prevailing in our last. The weekly ore product of this mine is about the same as that of the California Company—viz., 2,500 tons. The bullion product, on May account, to the 13th instant, is reported at $245,838.

The Morgan Mill, on the Carson River, will soon start upon ores from the bonanza mines.

Chollar Potosi is down $5 per share; the weekly ore product of this mine is about 600 tons, which averages at assay, $30 per ton.

Ophir is $1 higher; the bullion product of this mine for the month of April amounted to $211,044.

Meadow Valley.—This stock has declined 50c. per share, and is now quoted at 50c. per share. There are 60,000 shares in the company, so that the market value of the mine is only $30,000. The company has levied an assessment of $1 per share delinquent, June 3d. The question of its payment depends upon the confidence of the stockholders in the value of the mine. If the assessment is not paid, the probable destiny of Meadow Valley is to take its place among the "abandoned mines."

Crown Point.—The decline in this stock is a marked feature in our report. Our quotation, to-day, of $11, is $6 per share below the rate quoted last week.

The Justice Mine has begun to produce ore, and is supplying sufficient to run the Excelsior and Sherman Mills. Two additional mills will be started about June 1.

The Eureka G. V. Mine produced 460 ounces of gold amalgam in a recent weekly run.

Tybo Consolidated has produced a total of $17,451 on May account.

White Pine, Nevada.—Operations on a more extensive scale than heretofore have been undertaken in this district. The Eberhardt has raised 1,000 tons of ore, and has started the mills.

The Utah Silver Mines now average about $500,000 per month in bullion, and 1,500 tons of base bullion. The Wet Mountain district leads in the value of its product.

The Sutro Tunnel was in 13,145 feet on the 8th inst. Details of work for the week:—Holes drilled, 296; holes blasted, 406; aggregate depth, 2,431 feet; average depth, 8·2 feet; powder consumed, 1,324 lb.; exploders consumed, 406; drills sharpened, 569; rock extracted, carloads, two tons each, 425. The rock is Comstock porphyry. It is hard, difficult to drill, and blasts badly.

Dividends.—Northern Belle, $1 per share; Black Bear quartz, 75 cents. Assessments, with dates when delinquent: Trojan, 60 cents, June 11th; New Coso, 50 cents, June 14th; General Thomas, 50 cents, June 15th; Equitable Tunnel, 20 cents, June 15th; Howard Hill, $2.50, June 17th; Daney, 15 cents, June 20th; Hale & Norcross $1.50, June 21st; Newark, 50 cents, June 20th; Rising Star, 10 cents, June 15th.

QUOTATIONS:

	No. of feet on Vein.	No. of shares.	May 18.	May 25.
Sierra Nevada	3,300	100,000	$16	$15
Union Consol'd	600	100,000	12	12
Mexican	600	108,000	32	33
Ophir	675	108,000	55	56
California	600	540,000	79	80
Consol'd. Virginia	710	540,000	73	73
Best & Belcher	540	100,800	58	55
Gould & Curry	612	100,800	18	16
Savage	771	112,000	20	18
Hale & Norcross	400	16,000	64	64
Chollar Potosi	1,400	28,000	90	85
Alpha Consol'd	306	30,000	68	57
Imperial Con	468	500,000	5	6
Yellow Jacket	957	120,000	37	37
Kentuck	95	30,000	14	14
Crown Point	541	100,000	17	11
Belcher	1,040	104,000	22	22
Overman	1,100	38,400	68	63
Caledonia	2,188	100,000	9	9
Justice	2,100	105,000	27	24
Raymond & Ely	5,000	30,000	13	11
Meadow Valley	4,400	60,000	1	50c
Eureka Consolid.	....	50,000	12	11
Eureka G. V.	1,680	20,000	3	3
Silver Hill	5,400	54,000	9	8
Julia	3,000	110,000	12	10

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & CO., Bankers and Brokers, Room 7 Traveller Building, 31 State Street, Boston.

BOSTON, THURSDAY EVENING, May 25, 1876.

The market remains the same as previously reported. Allouez sold at 11 bid. Calumet firm at 166½, and very little stock changing hands. Copper Falls has advanced from 3 to 4 sale, but has become weaker again at 3¾ asked. Franklin rather firm at 11¼ bid. Pewabic is stronger at 4 bid, but no sales. Quincy is desirably stronger at 46, sale and bid. Nothing doing in small copper. It is reported from official sources that the Quincy have earned $4 per share the first four months of this year.

Taunton Copper Company.—4 shares of this stock have sold during the week at $400 per share.

DESCRIPTION.	Par Value.	No. of Shares.	CLOSING. Bid.	Asked.
Allouez	$50	20,000	$11 00	$ —
Calumet and Hecla	25	80,000	166 50	167 00
Central	25	20,000	30 50	32 00
Copper Falls	50	20,000	3 25	3 75
Dana	25	20,000	8	10
Franklin	25	20,000	11 25	11 75
Humboldt	25	20,000	9	11
Madisca	25	20,000	27	30
Mesnard	25	20,000	55	62½
Minnesota	25	20,000	1 50	2 00
National	15	20,000	1 50	1 75
Osceola	25	40,000	21 00	22 00
Petherick	25	20,000	55	60
Pewabic	25	20,000	4 00	4 50
Phenix	25	20,000	12 00	13 00
Quincy	25	20,000	46 00	46 50
Ridge	25	20,000	4 75	5 00
Rockland	25	20,000	20	25
International Silver	20	60,000	8	10
Star	25	20,000	50	52
Superior	25	20,000	10	12½
Duncan Silver	20	60,000	1 12½	1 37½

Gas Stocks.

NEW YORK, Friday Evening, May 26, 1876.

There appears to be no demand for New York gas stocks, and the general market continues in the same dull condition which we have noted for several weeks past.

New York Gas Company.—We lower the quotation of this company $5 per share. It is announced that its annual meeting will occur on the 5th of June, for the election of Directors, etc.

Metropolitan (N. Y.) Gas Company.—This stock is lower, and inactive.

With but a single exception, our changes in the prices of Brooklyn gas stocks are to lower figures.

The Frederick (Maryland) Gas Company charge the people of that place $4 per 1,000 feet for gas.

Sales of Eastern gas stocks for the week are reported to us as follows:

Lynn, Mass., Gas Company.—15 shares at from 78 to 83.

Chelsea, Mass., Gas Company.—5 shares at 114.

Wakefield, Mass., Gas Company.—3 shares at 58 per share.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Quotations "bid" and "asked" of New York City and Vicinity Gas Companies are on the $100 of stock and not on one share.

Companies in New York and Vicinity	Cap. Stk.	Par.	last Div.	When Paid.	Bid.	Askd.
			pr.c			
Mutual, N. Y.	$5,000,000	$ 100	2½	Jan. '76	109½	110½
" " Bonds	900,00	1,000	3½	Feb. '76	105	
NewYork, "	4,000,000		5	Jan. '76	130	140
Metropol. "	2,500,000	100	5	Mar. '76	142	145
" " Certf.	1,000 000	...	3½	" "	103½	
" " Bonds	500,000	1,000	3½	Jan. "	105	
Harlem "	1,850,000	50	4	Feb. '76	118	122
Manhattan "	4,000,000	50	10	Jan. "	250	255
Brooklyn, B'klyn	2,000,000	25	5	Nov. '75	190	200
Nassau "	1,000,000	20	4	Jan. '76	80	85
" " Certf.	700,000	1,000	3½	Nov. '76	94	95
People's "	1,000,000	10	3½	Jan. '76	50	60
" " Certf.	300,000	1,000	3½	Jan. '76	83½	87
" " Bds	325,000	....	3½	Feb. "		95
Metropol. "	1,000,000	10	3½	Nov. '75	70	75
Wmsburgh "	1,000,000	50	5	Jan. '76	122	130
" " Certf.	1,000,000	....	3½	Jan. "	100	102
Citizen's "	1,200,000	20	2½	Jan. '76	87	90
" " Certf.	320,000	1,000	3½	April "	99	101
J. C. N.J.	386,000	20	5	July,'75	160	170
Centl. Westch. N.Y.	466,000	50	4	July. "	95	100
Subur'n " "	390,000	50				95

† Gold.

Companies out of Town.*	Cap. Stk.	Par	Bid	Askd.
People's " " of J. C.			120	133
¶Citizen's G. L. Co., New'k. N.J.	1,095,000	50	85	90
Hempstead " " L. I., N.Y.	40,000	100		100
Jamaica, " " "	25,000	100		100
Richmond Co., S. I. "	300,000		100	105
Citizens', Rochester, "		100	60	68
Rochester Gas Co., "		100	50	
‡People's G. L. Co. Albany,"	1,000,000	100		25
§Mutual " Buffalo "	750,000	100	48	55
Mutual " Detroit Mich.		50	18	
TroyG. L. Co., Troy, N. Y.			108	
Citizens " "	600,000	100		100
Brockport, N. Y., G. L. Co.	25,000	100	60	80
‡Baltimore G. L. Co., Balt., Md	2,000,000	100		180
St. Louis G. L. Co., St.Louis, Mo	600,000		110	130
People's G. L. Co., Balt. Md	2,000,000	25	25	25½
Hannibal G. L. Co., Hanni., Mo.	100,000	100	95	100
La Clede, St. Louis, Mo	1,200,000	100	110	115
Lewiston G. L. Co., Lewis., Me	400,000	100	50	85
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	125⅛	
Jacksonville, Ill.	120,000	100	82	
‡Lima, Ohio.	60 000	100	10	
Derby G. L. Co., Derby, Conn.	160,000	100	60	80
Woonskt G. L. Co. Woonskt, R.I.	150,000	100	100	
Fort Wayne G. L. Co. F. W., Ind		100	90	100
North. Liberties G. L. Co. Phila.		25	29	
Wilkes-Barre G. L. Co W. B. Pa.		50	70	
Washington G. L. Co., Phila.			42	43
Pottsville, Pa. Gas Co.		50	40⅜	
Portland G. L. Co. Portland. Me	350,000	50	72	75
Hartford G. L. Co., Hartford. Ct	700,000	25	41	
Boston G. L. Co., Boston, Mass.	2,500,000	500	785	790
East Boston, Mass		25	132	
Chelsea G. L. Co. Chelsea, "	300,000		139	
Cambridge G. L. Co., Cam., "	700,000		132¾	
Louisville G. L. Co., Louis., Ky.			127	
Cincinnati G. L. Co., Cincin, O.				200
Carondelet G. L. Co., Mo.		50		6¼
S. F. G. L. Co, San Francisco, Cal	10,000,000	100	99	99½
Stillwater G. L. Co., Minn.	50,000	50		26
City G. L. Co. Montreal, Can.	1,440,000	40	166¾	
Consumers G. L (old.) Tor., Ont	600,000	50	133	
Hamilton G. L. Co., Ont.	150,000	40	112½	
Halifax G. L. Co., Halifax, N.S.	400,000	40	143	148

* These quotations represent the latest obtainable prices at which sales were made.

† This Company has issued $1,000,000 in certificates in addition to their stock indebtedness, on which they pay interest at the rate of 6 per cent. gold.

‡ This Company has $30,000 in bonds outstanding.

§ $200,000 represents the bonded indebtedness of this Company.

‖ $350,000 of the indebtedness of this company is represented by bonds.

¶ $124,000 of the indebtedness of this company is represented by bonds; also $53,000 in certificates, which is included in the aggregate stock debt quoted.

FIRE BRICK.

B. KREISCHER AND SON.

58 Goerck street,

Corner Delancey street, East River. NEW YORK.

Blocks, Slabs, and Clay Retorts,

Branch Works at Kreischerville, Staten Island.

ESTABLISHED 1845.

MANGANESE.

A VALUABLE DEPOSIT OF THIS MINERAL, located in NOVA SCOTIA, can be purchased at moderate cost. For particulars, as to quality, location, etc., apply to PERKINS & JOB, 27 South Street, New York.

PORTLAND AND KEENE'S CEMENT.

From the best London Manufacturers. For sale by JAMES BRAND, 85 Beekman street, N. Y.

A Practical Treatise on Cement furnished for 25 cents.